Excel Formulas Cheat Sheet

If you want to be a power user of MS Excel, you must master the most useful Excel formulas of Excel. To be frank, it is not an easy task for all as the functions are a lot in numbers.

One trick can help you!

Let me share the trick that I used and still use to master the formulas: I used to revise 5-10 Excel formulas every day before start working anything with Excel. This revision makes a permanent image of the formulas in my brain. Then wherever I see the name of an Excel formula, I can quickly remember its syntax and uses. This helps me a lot while I am trying to solve an Excel problem with formulas. You can use this trick to master anything complex, not only Excel formulas.

Excel Formulas with Examples in an Excel Sheet (Free Download .xlsx File)

I have documented all the above Excel formulas in a single Excel sheet so that you can tweak the formulas to understand and practice it better.

Click here to download the .xlsx file

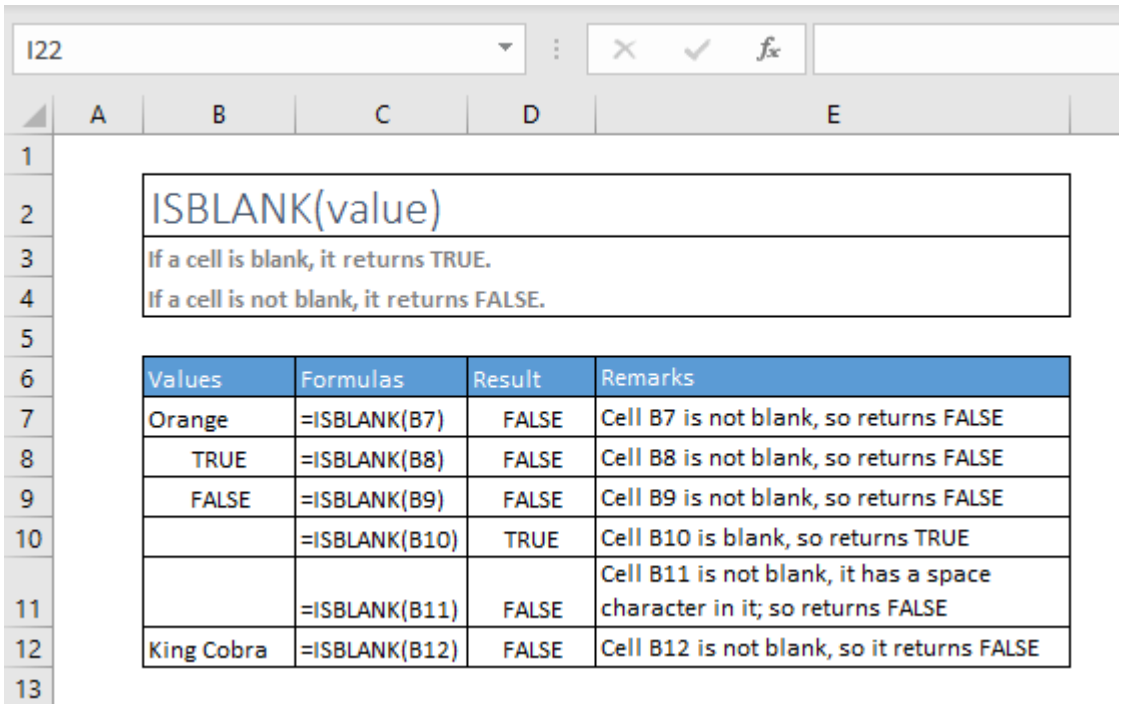
Excel Formulas with Examples

A. IS FUNCTIONS

1. ISBLANK

=ISBLANK(value)

If a cell is blank, it returns TRUE. If a cell is not blank, it returns FALSE.



Values	Formulas	Result	Remarks
Orange	=ISBLANK(B7)	FALSE	Cell B7 is not blank, so returns FALSE
TRUE	=ISBLANK(B8)	FALSE	Cell B8 is not blank, so returns FALSE
FALSE	=ISBLANK(B9)	FALSE	Cell B9 is not blank, so returns FALSE
	=ISBLANK(B10)	TRUE	Cell B10 is blank, so returns TRUE
	=ISBLANK(B11)	FALSE	Cell B11 is not blank, it has a space character in it; so returns FALSE
King Cobra	=ISBLANK(B12)	FALSE	Cell B12 is not blank, so it returns FALSE

2. ISERR

=ISERR(value)

Checks whether a value is an error (#VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!) excluding #N/A, and returns TRUE or FALSE

G27

	A	B	C	D	E
1					
2		ISERR(value)			
3		Checks whether a value is an error (#VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!) excluding			
4		#N/A, and returns TRUE or FALSE			
5					
6		Values	Formulas	Result	Remarks
7		#VALUE!	=ISERR(B7)	TRUE	Cell B7 has #VALUE! type error, so the formula returns TRUE
8		#REF!	=ISERR(B8)	TRUE	Cell B8 has #REF! type error, so the formula returns TRUE
9		#DIV/0!	=ISERR(B9)	TRUE	Cell B9 has #DIV/0!! type error, so the formula returns TRUE
10		#NUM!	=ISERR(B10)	TRUE	Cell B10 has #NUM! type error, so the formula returns TRUE
11		#NAME?	=ISERR(B11)	TRUE	Cell B11 has #NAME? type error, so the formula returns TRUE
12		#NULL!	=ISERR(B12)	TRUE	Cell B12 has #NULL! type error, so the formula returns TRUE
13		#N/A	=ISERR(B13)	FALSE	Cell B13 has #N/A type error, so the formula returns FALSE
14		Apple	=ISERR(B14)	FALSE	Cell B14 has a text, so the formula returns FALSE
15					

3. ISERROR

ISERROR(value)

Checks whether a value is an error (#N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!), and returns TRUE or FALSE

G31

	A	B	C	D	E
1					
2		ISERROR(value)			
3		Checks whether a value is an error (#N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!), and			
4		returns TRUE or FALSE			
5					
6		Values	Formulas	Result	Remarks
7		#VALUE!	=ISERROR(B7)	TRUE	Cell B7 has #VALUE! type error, so the formula returns TRUE
8		#REF!	=ISERROR(B8)	TRUE	Cell B8 has #REF! type error, so the formula returns TRUE
9		#DIV/0!	=ISERROR(B9)	TRUE	Cell B9 has #DIV/0!! type error, so the formula returns TRUE
10		#NUM!	=ISERROR(B10)	TRUE	Cell B10 has #NUM! type error, so the formula returns TRUE
11		#NAME?	=ISERROR(B11)	TRUE	Cell B11 has #NAME? type error, so the formula returns TRUE
12		#NULL!	=ISERROR(B12)	TRUE	Cell B12 has #NULL! type error, so the formula returns TRUE
13		#N/A	=ISERROR(B13)	TRUE	Cell B13 has #N/A type error, so the formula returns TRUE
14		Apple	=ISERROR(B14)	FALSE	Cell B14 has a text, so the formula returns FALSE
15					

4. ISEVEN

ISEVEN(value)

Returns TRUE if the number is even

H23

	A	B	C	D	E
1					
2		ISEVEN(value)			
3		Returns TRUE if the number is even			
4					
5		Values	Formulas	Result	Remarks
6		5	=ISEVEN(B6)	FALSE	The number is not even, so the formula returns FALSE.
7		10	=ISEVEN(B7)	TRUE	The number is even, so the formula returns TRUE.
8		81/9	=ISEVEN(B8)	#VALUE!	The cell has a text value, so the formula returns the #VALUE! type error.
9		Excel 2013	=ISEVEN(B9)	#VALUE!	The cell has a text value, so the formula returns the #VALUE! type error.
10					

5. ISODD

ISODD(value)

Returns TRUE if the number is odd

H23

	A	B	C	D	E
1					
2		ISODD(value)			
3		Returns TRUE if the number is odd			
4					
5		Values	Formulas	Result	Remarks
6		5	=ISODD(B6)	TRUE	The number is odd, so the formula returns FALSE.
7		10	=ISODD(B7)	FALSE	The number is not odd, so the formula returns TRUE.
8		81/9	=ISODD(B8)	#VALUE!	The cell has a text value, so the formula returns the #VALUE! type error.
9		Excel 2013	=ISODD(B9)	#VALUE!	The cell has a text value, so the formula returns the #VALUE! type error.
10					

6. ISFORMULA

ISFORMULA(value)

Checks whether a reference is to a cell containing a formula, and returns TRUE or FALSE

H19

	A	B	C	D	E
1					
2		ISFORMULA(value)			
3		Checks whether a reference is to a cell containing a formula, and returns TRUE or FALSE			
4					
5		Values	Formulas	Result	Remarks
6		04-08-21	=ISFORMULA(B6)	TRUE	The cell B6 holds formula =TODAY(), so the formula returns TRUE.
7		31-10-15	=ISFORMULA(B7)	FALSE	The cell B7 holds a date value, so the formula returns FALSE.
8		04-08-21 23:03	=ISFORMULA(B8)	TRUE	The cell B8 holds =NOW() formula, so the formula returns TRUE.
9		Kawser Ahmed	=ISFORMULA(B9)	FALSE	The cell B9 holds a text, so the formula returns FALSE.
10		Marissa Kawser	=ISFORMULA(B10)	FALSE	The cell B10 holds a text, so the formula returns FALSE.
11					

7. ISLOGICAL

ISLOGICAL(value)

Checks whether a value is a logical value (TRUE or FALSE), and returns TRUE or FALSE

H23

	A	B	C	D	E
1					
2		ISLOGICAL(value)			
3		Checks whether a values is a logical value (TRUE or FALSE), and returns TRUE or FALSE			
4					
5		Values	Formulas	Result	Remarks
6		TRUE	=ISLOGICAL(B6)	TRUE	The cell B6 holds logical value TRUE, so the formula returns TRUE.
7		FALSE	=ISLOGICAL(B7)	TRUE	The cell B7 holds logical value FALSE, so the formula returns TRUE.
8		"TRUE"	=ISLOGICAL(B8)	FALSE	The cell B8 holds a text value, so the formula returns FALSE.
9			=ISLOGICAL(B1=B2)	TRUE	B1=B2 will return either TRUE or FALSE, so the formula will return TRUE.
10					

8. ISNA

ISNA(value)

Checks whether a value is #N/A, and returns TRUE or FALSE

H17

	A	B	C	D	E
1					
2		ISNA(value)			
3		Checks whether a value is #N/A, and returns TRUE or FALSE			
4					
5		Values	Formulas	Result	Remarks
6		#VALUE!	=ISNA(B6)	FALSE	Cell B6 holds #VALUE! type error, so the formula returns FALSE.
7		#REF!	=ISNA(B7)	FALSE	Cell B7 holds #REF! type error, so the formula returns FALSE.
8		#NAME?	=ISNA(B8)	FALSE	Cell B8 holds #NAME? type error, so the formula returns FALSE.
9		#N/A	=ISNA(B9)	TRUE	Cell B9 holds #N/A type error, so the formula returns TRUE.
10					

9. ISNUMBER

ISNUMBER(value)

Checks whether a value is a number, and returns TRUE or FALSE

G18

	A	B	C	D	E
1					
2		ISNUMBER(value)			
3		Checks whether a value is a number, and returns TRUE or FALSE			
4					
5		Values	Formulas	Result	Remarks
6		Text	=ISNUMBER(B6)	FALSE	Cell B6 holds a text value, so the formula returns FALSE.
7		15	=ISNUMBER(B7)	TRUE	Cell B7 holds value 15, so the formula returns TRUE.
8		#VALUE!	=ISNUMBER(B8)	FALSE	Cell B8 holds #VALUE! type error, so the formula returns FALSE.
9		89	=ISNUMBER(B9)	TRUE	Cell B9 holds value 89 (though it is formatted as a text value), so the formula returns TRUE.
10		04-08-21	=ISNUMBER(B10)	TRUE	Cell B10 holds a date value and a date is a number in Excel system, so the formula returns TRUE.
11					

10. ISREF

ISREF(value)

Checks whether a value is a reference, and returns TRUE or FALSE

H20

	A	B	C	D	E
1					
2		ISREF(value)			
3		Checks whether a value is a reference, and returns TRUE or FALSE			
4					
5		Values	Formulas	Result	Remarks
6			=ISREF(B1)	TRUE	B1 is a cell reference, so the formula returns TRUE.
7			=ISREF(B1: B10)	TRUE	B1: B10 is range reference, so the formula returns TRUE.
8			=ISREF(B1: D4 C1: C5)	TRUE	B1: D4 C1: C5 results in an intersection, so the formula returns TRUE.
9			=ISREF('B1')	FALSE	As 'B1' is not a cell reference.
10			=ISREF(INDIRECT("B1"))	TRUE	As INDIRECT() function returns a reference specified by the text string you use as the argument.
11					

11. ISTEXT

ISTEXT(value)

Checks whether a value is text, and returns TRUE or FALSE

H22

	A	B	C	D	E
1					
2		ISTEXT(value)			
3		Checks whether a value is text, and returns TRUE or FALSE			
4					
5		Values	Formulas	Result	Remarks
6		Excel 2013	=ISTEXT(B6)	TRUE	Cell B6 holds a text value, so the formula returns TRUE.
7		21 Wise Men	=ISTEXT(B7)	TRUE	Cell B7 holds a text value, so the formula returns TRUE.
8		#VALUE!	=ISTEXT(B8)	FALSE	Cell B8 holds an error value, so the formula returns FALSE.
9		45	=ISTEXT(B9)	FALSE	Cell B9 holds a number value, so the formula returns FALSE.
10					

12. ISNONTEXT

ISNONTEXT(value)

Checks whether a value is not text (blank cells are not text), and returns TRUE or FALSE

I18

	A	B	C	D	E
1					
2		ISNONTEXT(value)			
3		Checks whether a value is not text (blank cells are not text), and returns TRUE or FALSE			
4					
5		Values	Formulas	Result	Remarks
6		TRUE	=ISNONTEXT(B6)	TRUE	Cell B6 holds a non-text value, so the formula returns TRUE.
7		Peter	=ISNONTEXT(B7)	FALSE	Cell B7 holds a text value, so the formula returns FALSE.
8		24-02-00 0:00	=ISNONTEXT(B8)	TRUE	Cell B8 holds a non-text value, so the formula returns TRUE.
9		#VALUE!	=ISNONTEXT(B9)	TRUE	Cell B9 holds a non-text value, so the formula returns TRUE.
10					

B. CONDITIONAL FUNCTIONS

13. AVERAGEIF

AVERAGEIF(range, criteria, [average_range])

Finds average (arithmetic mean) for the cells specified by a given condition or criteria

N30

AVERAGEIF(range, criteria, [average_range])

Finds average (arithmetic mean) for the cells specified by a given condition or criteria

Region	Sales
East	500
West	50
North	100
South	25
Mid West	200
South New Office	30
East	35
West	50
South	15
North	25
North New Office	40
5	50
5	100
2	200
4	35
2	45
4	50
TRUE	90
FALSE	100
TRUE	125
TRUE	115
FALSE	55

Formula	Result	Remarks
=AVERAGEIF(B6:B27, "East", C6:C27)	267.5	Average of all the Sales for East region.
=AVERAGEIF(B6:B27, "North", C6:C27)	62.5	Average of all the Sales for North region.
=AVERAGEIF(B6:B27, "North*", C6:C27)	55	Average of all the Sales for North region (including North (New Office) region).
=AVERAGEIF(B6:B27, "*New Office", C6:C27)	35	Average of all the Sales for the New Offices.
=AVERAGEIF(B6:B27, ">=4", C6:C27)	58.75	Average of all the Sales for the values greater than or equal to 4.
=AVERAGEIF(B6:B27, 5, C6:C27)	75	Average of all the Sales for the values equal to 5.
=AVERAGEIF(B6:B27, TRUE, C6:C27)	110	Average of all the Sales for the values equal to TRUE statement.
=AVERAGEIF(B6:B27, FALSE, C6:C27)	77.5	Average of all the Sales for the values equal to FALSE statement.

Warnings

- Cells in range that contain TRUE or FALSE are ignored.
- If a cell in average_range is an empty cell, AVERAGEIF ignores it.
- If range is a blank or text value, AVERAGEIF returns the #DIV0! error value.
- If a cell in criteria is empty, AVERAGEIF treats it as a 0 value.
- If no cells in the range meet the criteria, AVERAGEIF returns the #DIV/0! error value.
- You can use the wildcard characters, question mark (?) and asterisk (*), in criteria. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (~) before the character.
- **Average_range** does not have to be the same size and shape as **range**. The actual cells that are averaged are determined by using the top, left cell in **average_range** as the beginning cell, and then including cells that correspond in size and shape to **range**.

14. SUMIF

SUMIF(range, criteria, [sum_range])

Adds the cells specified by a given condition or criteria

J31

SUMIF(range, criteria, [sum_range])

Adds the cells specified by a given condition or criteria

Region	Sales
East	500
West	50
North	100
South	25
Mid West	200
South New Office	30
East	35
West	50
South	15
North	25
North New Office	40
5	50
5	100
2	200
4	35
2	45
4	50
TRUE	90
FALSE	100
TRUE	125
TRUE	115
FALSE	55

Formula	Result	Remarks
=SUMIF(B6:B27, "East", C6:C27)	535	Sum of all the Sales for East region.
=SUMIF(B6:B27, "North", C6:C27)	125	Sum of all the Sales for North region.
=SUMIF(B6:B27, "North*", C6:C27)	165	Sum of all the Sales for North region (including North (New Office) region).
=SUMIF(B6:B27, "*New Office", C6:C27)	70	Sum of all the Sales for the New Offices.
=SUMIF(B6:B27, ">=4", C6:C27)	235	Sum of all the Sales for the values greater than or equal to 4.
=SUMIF(B6:B27, 5, C6:C27)	150	Sum of all the Sales for the values equal to 5.
=SUMIF(B6:B27, TRUE, C6:C27)	330	Sum of all the Sales for the values equal to TRUE statement.
=SUMIF(B6:B27, FALSE, C6:C27)	155	Sum of all the Sales for the values equal to FALSE statement.

Warnings

■ The SUMIF function returns incorrect results when you use it to match strings longer than 255 characters or to the string #VALUE!.

■ The ***sum_range*** argument does not have to be the same size and shape as the ***range*** argument. The actual cells that are added are determined by using the upper leftmost cell in the ***sum_range*** argument as the beginning cell, and then including cells that correspond in size and shape to the ***range*** argument.

15. COUNTIF

COUNTIF(range, criteria)

Counts the number of cells within a range that meet the given condition

J30

COUNTIF(range, criteria)

Counts the number of cells within a range that meet the given condition

Region	Sales
East	500
West	50
North	100
South	25
Mid West	200
South New Office	30
East	35
West	50
South	15
North	25
North New Office	40
5	50
5	100
2	200
4	35
2	45
4	50
TRUE	90
FALSE	100
TRUE	125
TRUE	115
FALSE	55

Formula	Result	Remarks
=COUNTIF(B6:B27, "East")	2	Count the number of cells with East in cells B6 through B27.
=COUNTIF(B6:B27, "North")	2	Count the number of cells with North in cells B6 through B27.
=COUNTIF(C6:C27,">=100")	8	Count the number of cells with values greater than and equal to 100.
=COUNTIF(C6:C27, "<="&C8)	17	Count the number of cells with values less than and equal to the value of cell C8.
=COUNTIF(B6:B27, "No*")	3	Count the number of cells with values that start with "No" characters.
=COUNTIF(B6:B27, "Ea??")	2	Count the number of cells with values that start with "Ea" characters and then have any two characters.

Warnings

- The COUNTIF function returns incorrect results when you use it to match strings longer than 255 characters.
- Be sure to enclose the ***criteria*** argument in quotes.

16. AVERAGEIFS

AVERAGEIFS(average_range, criteria_range1, criteria1, [criteria_range2, criteria2], …)

Finds average (arithmetic mean) for the cells specified by a given set of conditions or criteria

K33

AVERAGEIFS(average_range, criteria_range1, criteria1, [criteria_range2, criteria2], …)

Finds average (arithmetic mean) for the cells specified by a given set of conditions or criteria

Product	Sales Person	Quantity Sold
Apple	Tom	10
Orange	Jon	4
Apple	Marissa	12
Carrot	Kawser	5
Banana	Khan	13
Apple	Tom	15
Banana	Jon	14
Carrot	Kawser	12
Orange	Jon	8
Carrot	Marissa	9
Apple	Tom	15
Banana	Jon	20
Carrot	Marissa	25

Formula	Result	Remarks
=AVERAGEIFS(D6:D18, B6:B18, "Apple", C6:C18, "Tom")	13.3333	Average Quantity Sold of Apple product by Sales Person Tom.
=AVERAGEIFS(D6:D18, B6:B18, "Banana", C6:C18, "Marissa")	#DIV/0!	product by Sales Person Marissa. Marissa didn't sell Banana. So #DIV/0! error is showing in the cell.
=AVERAGEIFS(D6:D18, B6:B18, "Carrot", C6:C18, "Marissa")	17	Average Quantity Sold of Carrot product by Sales Person Marissa.

Warnings

■ If average_range is a blank or text value, AVERAGEIFS returns the #DIV0! error value.

■ If a cell in a criteria range is empty, AVERAGEIFS treats it as a 0 value.

■ Cells in range that contain TRUE evaluate as 1; cells in range that contain FALSE evaluate as 0 (zero). *Remember in AVERAGEIF() function TRUE or FALSE statements were neglected.

■ Each cell in average_range is used in the average calculation only if all of the corresponding criteria specified are true for that cell.

■ Unlike the range and criteria arguments in the AVERAGEIF function, in AVERAGEIFS each criteria_range must be the same size and shape as sum_range.

■ If cells in average_range cannot be translated into numbers, AVERAGEIFS returns the #DIV0! error value.

■ If there are no cells that meet all the criteria, AVERAGEIFS returns the #DIV/0! error value.

■ You can use the wildcard characters, question mark (?) and asterisk (*), in criteria. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (~) before the character.

17. SUMIFS

SUMIFS(sum_range, criteria_range1, criteria1, [criteria_range2, criteria2],

…) Adds the cells specified by a given set of conditions or criteria

K32

SUMIFS(sum_range, criteria_range1, criteria1, [criteria_range2, criteria2], …)

Adds the cells specified by a given set of conditions or criteria

Product	Sales Person	Quantity Sold
Apple	Tom	10
Orange	Jon	4
Apple	Marissa	12
Carrot	Kawser	5
Banana	Khan	13
Apple	Tom	15
Banana	Jon	14
Carrot	Kawser	12
Orange	Jon	8
Carrot	Marissa	9
Apple	Tom	15
Banana	Jon	20
Carrot	Marissa	25

Formula	Result	Remarks
=SUMIFS(D6:D18, B6:B18, "Apple", C6:C18, "Tom")	40	Sums the Quantity Sold of Apple product by Sales Person Tom.
=SUMIFS(D6:D18, B6:B18, "Banana", C6:C18, "Marissa")	0	Sums the Quantity Sold of Banana product by Sales Person Marissa. Marissa didn't sell Banana. So #DIV/0! error is showing in the cell.
=SUMIFS(D6:D18, B6:B18, "Carrot", C6:C18, "Marissa")	34	Sums the Quantity Sold of Carrot product by Sales Person Marissa.

18. COUNTIFS

COUNTIFS(criteria_range1, criteria1, [criteria_range2, criteria2], …)

Counts the number of cells specified by a given set of conditions or criteria

K29

COUNTIFS(criteria_range1, criteria1, [criteria_range2, criteria2], ...)

Counts the number of cells specified by a given set of conditions or criteria

Product	Sales Person	Quantity Sold
Apple	Tom	10
Orange	Jon	4
Apple	Marissa	12
Carrot	Kawser	5
Banana	Khan	13
Apple	Tom	15
Banana	Jon	14
Carrot	Kawser	12
Orange	Jon	8
Carrot	Marissa	9
Apple	Tom	15
Banana	Jon	20
Carrot	Marissa	25

Formula	Result	Remarks
=COUNTIFS(D6:D18, ">=10", D6:D18, "<=25")	9	Count the number of cells in the range D6: D18 that have values greater than or equal to 10, and less than or equal to 25.
=COUNTIFS(B6:B18, "Apple", C6:C18, "Tom")	3	Count the number of rows from the ranges B6: B18 and C6: C18 that have Apple and Tom values in them respectively.
=COUNTIFS(D6:D18, ">="&D6, C6:C18, "Marissa")	2	Count the number of rows from the ranges D6: D18 and C6: C18 that have a value greater than or equal to cell D6 and a value Marissa respectively.

Warnings

- Each range's criteria is applied one cell at a time. If all of the first cells meet their associated criteria, the count increases by 1. If all of the second cells meet their associated criteria, the count increases by 1 again, and so on until all of the cells are evaluated.
- If the criteria argument is a reference to an empty cell, the **COUNTIFS** function treats the empty cell as a 0 value.
- You can use the wildcard characters— the question mark (?) and asterisk (*) — in criteria. A question mark matches any single character, and an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (~) before the character.

19. IF

IF(logical_test, [value_if_true], [value_if_false]

Checks whether a condition is met, and returns one value if TRUE, and another value is FALSE

L30

IF(logical_test, [value_if_true], [value_if_false]

Checks whether a condition is met, and returns one value if TRUE, and another value is FALSE

Actual Expense	Predicted Expense
1500	900
500	900
525	925

Formula	Result	Remarks
=IF(B6>C6, "Over Budget", "OK")	Over Budget	Simple IF formula.
=IF(B7>C7,"Over Budget", IF(B8<C8,"Budget OK","Not OK"))	Budget OK	Nested IF Formula. At first calculate the return value of the deepest IF function. Deepest IF function means that IF function that does not have no more function inside it.

20. IFERROR

IFERROR(value, value_if_error)

Returns value_if_error if expression is an error and the value of the expression itself otherwise

K32

	Quota	Units Sold	Formula	Result	Remarks
IFERROR(value, value_if_error)					
Returns value_if_error if expression is an error and the value of the expression itself otherwise					
	210	35	=IFERROR(B6/C6, "Error in Calculations?")	6	Returns 6 as the value argument does not return any error.
	55	0	=IFERROR(B7/C7, "Error in Calculations?")	Error in Calculations?	Returns the value_if_error argument as the value argument returns an error.
		25	=IFERROR(B8/C8, "Error in Calculations?")	0	Though the cell B8 has nothing in it, but Excel treats nothing as Zero value, so the formula returns 0.

21. IFNA

IFNA(value, value_if_na)

Returns the value you specify if the expression resolves to #N/A, otherwise returns the result of the expression

L30

IFNA(value, value_if_na)

Returns the value you specify if the expression resolves to #N/A, otherwise returns the result of the expression

Post Box	Code
Rampura	1219
Gulshan	1217
Dhamrai	1203
Motijheel	1200
Khilgaon	1000

Formula	Result	Remarks
=IFNA(VLOOKUP("Marissa", B6:C10, 2,FALSE), "Code is not Found")	Code is not Found	VLOOKUP function returns #N/A error when it does not find value. When #N/A is returned, IFNA function returns the value of the value_if_na expression.

Warnings

- If Value or Value_if_na is an empty cell, IFNA treats it as an empty string value ("").
- If Value is an array formula, IFNA returns an array of results for each cell in the range specified in value.

C. MATHEMATICAL FUNCTIONS

22. SUM

SUM(number1, [number2], [number3], [number4], …)

Adds all the numbers in a range of cells

J20

SUM(number1, [number2], [number3], [number4], …)

Adds all the numbers in a range of cells

Values
-5
15
30
5
TRUE
FALSE

Formula	Result	Remarks
=SUM(B6:B11)	40	When you take a range as the SUM function's argument, it neglects Text values, and TRUE or FALSE statements.
=SUM(B6:B8, "5", TRUE, FALSE)	46	In this formula, "5" is first translated into a number, TRUE is translated into 1, and FALSE is translated into 0.

Warnings

- If an argument is a cell range or reference, only numeric values in the reference or range can be added. Empty cells, logical values like TRUE, or text are ignored.

23. AVERAGE

AVERAGE(number1, [number2], [number3], [number4], …)

Returns the average (arithmetic means) of its arguments, which can be numbers or names, arrays, or references that contain numbers

J27

AVERAGE(number1, [number2], [number3], [number4], ...)

Returns the average (arithmetic means) of its arguments, which can be numbers or names, arrays, or references that contain numbers

Values
-5
15
30
5
TRUE
FALSE

Formula	Result	Remarks
=AVERAGE(B6:B11)	13.33333333	When you take a range as the AVERAGE function's argument, it neglects Text values, and TRUE or FALSE statements.
=AVERAGE(B6:B8, "5", TRUE, FALSE)	7.666666667	In this formula, "5" is first translated into a number, TRUE is translated into 1, and FALSE is translated into 0. Total 46 is divided by 6.

Warnings

- Arguments can either be numbers or names, ranges, or cell references that contain numbers.
- Logical values and text representations of numbers that you type directly into the list of arguments are counted.
- If a range or cell reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value zero are included.
- Arguments that are error values or text that cannot be translated into numbers cause errors.
- If you want to include logical values and text representations of numbers in a reference as part of the calculation, use the **AVERAGEA** function.
- If you want to calculate the average of only the values that meet certain criteria, use the **AVERAGEIF** function or the **AVERAGEIFS** function.

24. AVERAGEA

AVERAGEA(value1, [value2], [value3], [value4], ...)

Returns the average (arithmetic means) of its arguments, evaluating text and FALSE in arguments as 0; TRUE evaluates as 1. Arguments can be numbers, names, arrays, or references.

J29

AVERAGEA(value1, [value2], [value3], [value4], ...)

Returns the average (arithmetic means) of its arguments, evaluating text and FALSE in arguments as 0; TRUE evaluates as 1. Arguments can be numbers, names, arrays, or references.

Values
-5
15
30
5
TRUE
FALSE

Formula	Result	Remarks
=AVERAGEA(B7:B12)	6.833333333	In AVERAGEA function when you use a range as the arguments, text and FALSE in the range are evaluated as 0, TRUE is evaluated as 1.
=AVERAGEA(B7:B9, "5", TRUE, FALSE)	7.666666667	But, in this formula, "5" is first translated into a number, TRUE is translated into 1, and FALSE is translated into 0. Total is 46 and when divided by 6 results in like AVERAGE function.

Warnings

- Arguments can be the following: numbers; names, arrays, or references that contain numbers; text representations of numbers; or logical values, such as TRUE and FALSE, in a reference.
- Logical values and text representations of numbers that you type directly into the list of arguments are counted.
- Arguments that contain TRUE evaluate as 1; arguments that contain FALSE evaluate as 0 (zero).
- Array or reference arguments that contain text evaluate as 0 (zero). Empty text ("") evaluates as 0 (zero).
- If an argument is an array or reference, only values in that array or reference are used. Empty cells and text values in the array or reference are ignored.
- Arguments that are error values or text that cannot be translated into numbers cause errors.
- If you do not want to include logical values and text representations of numbers in a reference as part of the calculation, use the AVERAGE function.

25. COUNT

COUNT(value1, [value2], [value3], ...)

A24

COUNT(value1, [value2], [value3], …)

Counts the number of cells in a range that contain numbers

Values
-5
15
30
5
TRUE
FALSE

Formula	Result	Remarks
=COUNT(B6:B11)	3	When you pass a whole range as the argument of the COUNT function, it only counts the cells that have numbers.
=COUNT(B6:B8, "5", TRUE, FALSE)	6	But, in this formula, text value "5", TRUE and FALSE statements are also counted as numbers. So showing total 6 numbers.

Warnings

- Arguments that are numbers, dates, or a text representation of numbers (for example, a number enclosed in quotation marks, such as "1") are counted.
- Logical values and text representations of numbers that you type directly into the list of arguments are counted.
- Arguments that are error values or text that cannot be translated into numbers are not counted.
- If an argument is an array or reference, only numbers in that array or reference are counted. Empty cells, logical values, text, or error values in the array or reference are not counted.
- If you want to count logical values, text, or error values, use the **COUNTA** function.
- If you want to count only numbers that meet certain criteria, use the **COUNTIF** function or the **COUNTIFS**function.

26. COUNTA

COUNTA(value1, [value2], [value3], …)

Counts the number of cells in a range that are not empty

J30

COUNTA(value1, [value2], [value3], …)

Counts the number of cells in a range that are not empty

Values
-5
15
30
5
TRUE
FALSE

Formula	Result	Remarks
=COUNTA(B6:B11)	6	There are total 6 number of cells that are not empty.
=COUNTA(B6:B8, "5", TRUE, FALSE)	6	There are total 6 number of cells that are not empty.

Warnings

- The **COUNTA** function counts cells containing any type of information, including error values and empty text (""). For example, if the range contains a formula that returns an empty string, the **COUNTA** function counts that value. The **COUNTA** function does not count empty cells.
- If you do not need to count logical values, text, or error values (in other words, if you want to count only cells that contain numbers), use the **COUNT** function.
- If you want to count only cells that meet certain criteria, use the **COUNTIF** function or the **COUNTIFS** function.

27. MEDIAN

MEDIAN(number1, [number2], [number3], …)

Returns the median, or the number in the middle of the set of given numbers

MEDIAN(number1, [number2], [number3], …)

Returns the median, or the number in the middle of the set of given numbers

Data 1	Data 2
1	15
2	10
3	5
4	8
5	12
6	25
7	13
8	5

Formula	Result	Remarks
=MEDIAN(B6:B12)	4	From number 1 to 7, median is 4.
=MEDIAN(B6:B13)	4.5	From number 1 to 8, median is (4+5)/2 = 4.5
=MEDIAN(C6:C12)	12	For this data set median is 12. Arrange the data set in ascending order, you will get the median.
=MEDIAN(C6:C13)	11	For this data set median is 12. Arrange the data set in ascending order, you will get the median.

Warnings

- If there is an even number of numbers in the set, then MEDIAN calculates the average of the two numbers in the middle. See the second formula in the example.
- Arguments can either be numbers or names, arrays, or references that contain numbers.
- Logical values and text representations of numbers that you type directly into the list of arguments are counted.
- If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value zero are included.
- Arguments that are error values or text that cannot be translated into numbers cause errors.

28. SUMPRODUCT

SUMPRODUCT(array1, [array2], [array3], …)

Returns the sum of the products of corresponding ranges or arrays

SUMPRODUCT(array1, [array2], [array3], …)

Returns the sum of the products of corresponding ranges or arrays

Sales Person	Region	Products	Sales
Jon	West	Apple	100
Marissa	East	Orange	200
Kawser	East	Banana	125
Dipa	West	Banana	145
Neri	North	Orange	45
Jon	South	Apple	55
Dipa	West	Apple	25
Marissa	East	Orange	35
Jon	West	Orange	50
Kawser	South	Apple	60
Marissa	West	Banana	75
Jon	West	Apple	85

Formula	Result	Remarks
=SUMPRODUCT({4,5,6}, {10,20,10})	200	4*10 + 5*20 + 6*10 = 200
=SUMPRODUCT(--(B6:B17="Jon"), --(C6:C17="West"), E6:E17)	235	Finds the total Sales by Sales Person Jon in the West Region.

Warnings

- The array arguments must have the same dimensions. If they do not, SUMPRODUCT returns the #VALUE! error value.
- SUMPRODUCT treats array entries that are not numeric as if they were zeros.

29. SUMSQ

SUMSQ(number1, [number2], [number3], …)

Returns the sum of the squares of the arguments. The arguments can be numbers, arrays, names, or references to cells that contain numbers

M30

	A	B	C	D	E	F	G	H	I
1									
2		SUMSQ(number1, [number2], [number3], ...)							
3		Returns the sum of the squares of the arguments. The arguments can be numbers, arrays, names, or references							
4		to cells that contain numbers							
5									
6		Formula	Result	Remarks					
7		=SUMSQ(3, 4, 5)	50	3^2 + 4^2 + 5^2 = 50					
8									
9									
10				Warnings					
11		■ Arguments can either be numbers or names, arrays, or references that							
12		contain numbers.							
13		■ Numbers, logical values, and text representations of numbers that you type							
14		directly into the list of arguments are counted.							
15		■ If an argument is an array or reference, only numbers in that array or							
16		reference are counted. Empty cells, logical values, text, or error values in the							
17		array or reference are ignored.							
18		■ Arguments that are error values or text that cannot be translated into							
19		numbers cause errors.							
20									

30. COUNTBLANK

COUNTBLANK(range)

Counts the number of empty cells in a range

J27

	A	B	C	D	E	F	G	H	I
1									
2		COUNTBLANK(range)							
3		Counts the number of empty cells in a range							
4									
5		Values					Formula	Result	Remarks
6		5					=COUNTBLANK(B6:B12)	1	Cell B11 holds a space character, so only one blank cell is available in the range.
7		12							
8		8					Warnings		
9							■ Cells with formulas that return "" (empty text) are also counted. Cells with zero values are not counted.		
10		98					■ To run this formula, you need to turn off iterative calculation. Here's how:		
11							1) Click the **File** tab, and then click **Options.**		
12		Marissa					2) Click **Formulas**, and under **Calculation options**, clear the **Enable iterative calculation** check box, then click**OK.**		
13									
14									
15									

31. EVEN

EVEN(number)

Rounds a positive number up and negative number down to the nearest even integer

O30

EVEN(number)

Rounds a positive number up and negative number down to the nearest even integer

Formula	Result	Remarks
=EVEN(1.5)	2	Greater than 1.5 and nearest even number is 2
=EVEN(3)	4	Greater than 3 and nearest even number is 4
=EVEN(2)	2	Rounds 2 to the nearest even integer
=EVEN(-1)	-2	Less than -1 and nearest even integer is -2

Warnings

- If number is nonnumeric, EVEN returns the #VALUE! error value.
- Regardless of the sign of number, a value is rounded up when adjusted away from zero. If number is an even integer, no rounding occurs.

32. ODD

ODD(number)

Rounds a positive number up and negative number down to the nearest odd integer.

M24

ODD(number)

Rounds a positive number up and negative number down to the nearest odd integer.

Formula	Result	Remarks
=ODD(1.5)	3	Greater than 1.5 and nearest odd number is 2
=ODD(3)	3	Rounds 3 to the nearest odd number
=ODD(2)	3	Greater than 2 and nearest odd number is 3.
=ODD(-1)	-1	Nearest odd number of number -1

Warnings

- If number is nonnumeric, ODD returns the #VALUE! error value.
- Regardless of the sign of number, a value is rounded up when adjusted away from zero. If number is an odd integer, no rounding occurs.

33. INT

INT(number)

Rounds a number down to the nearest integer

N25

INT(number)

Rounds a number down to the nearest integer

Formula	Result	Remarks
=INT(8.9)	8	Rounds 8.9 down to the nearest integer
=INT(-8.9)	-9	Rounds -8.9 down to the nearest integer
=INT(19.5)	19	Rounds 19.5 down to the nearest integer

34. LARGE

LARGE(array, k)

Returns the k-th largest value in a data set. For example, the fifth largest number

L31

LARGE(array, k)

Returns the k-th largest value in a data set. For example, the fifth largest number

Values	Values
5	3
4	5
3	7
5	7
10	6

Formula	Result	Remarks
=LARGE(B6:C10, 5)	5	If we arrange the numbers in the range, we get: 10, 7, 7, 6, 5, 5, 5, 4, 3, 3. 5-th largest value in this data set is 5.
=LARGE(B6:C10, 8)	4	In the above data set, the 8-th largest value is 4.

Warnings

- If array is empty, LARGE returns the #NUM! error value.
- If k ≤ 0 or if k is greater than the number of data points, LARGE returns the #NUM! error value.
- If n is the number of data points in a range, then LARGE(array,1) returns the largest value, and LARGE(array,n) returns the smallest value.

35. SMALL

SMALL(array, k)

Returns the k-th smallest value in a data set. For example, the fifth smallest number

L27

SMALL(array, k)

Returns the k-th smallest value in a data set. For example, the fifth smallest number

Values	Values
5	3
4	5
3	7
5	7
10	6

Formula	Result	Remarks
=SMALL(B6:C10, 5)	5	If we arrange the numbers in the range, we get: 3, 3, 4, 5, 5, 5, 6, 7, 7, 10. The 5-th smallest value in this data set is 5.
=SMALL(B6:C10, 8)	7	In the above data set, the 8-th smallest value is 7.

Warnings

- If array is empty, SMALL returns the #NUM! error value.
- If k ≤ 0 or if k exceeds the number of data points, SMALL returns the #NUM! error value.
- If n is the number of data points in array, SMALL(array,1) equals the smallest value, and SMALL(array,n) equals the largest value.

36. MAX & MAXA

MAX(number1, [number2], [number3], [number4], …)

Returns the largest value in a set of values. Ignores logical values and text

MAXA(value1, [value2], [value3], [value4], …)

Returns the largest value in a set of values. Does not ignore logical values and text. MAXA function evaluates TRUE as 1, FALSE as 0 and any Text value as 0. Empty cells are ignored

N36

MAX(number1, [number2], [number3], [number4], …)

Returns the largest value in a set of values. Ignores logical values and text

MAXA(value1, [value2], [value3], [value4], …)

Returns the larget value in a set of values. Does not ignore logical values and text. MAXA function evaluates TRUE as 1, FALSE as 0 and any Text value as 0. Empty cells are ignored

Values	Values
0.3	Excel 2013
0.5	TRUE
-2	0.9
Marissa	FALSE
10	0.78
8	0.95
15	0.25
6	0.6

Formula	Result	Remarks
=MAX(C9:C16)	0.95	In the range C9:C16, MAX function returns 0.95. It ignores the TRUE, FALSE and Text values.
=MAXA(C9:C16)	1	In the same range C9: C16, MAXA function returns 1. It evaluates TRUE statement as 1 and it is the highest value in the range.
=MAX(B9:C16)	15	In the range B9: C16, highest value is 15.
=MAXA(B9:C16)	15	In the range B9: C16, highest value is 15.

Warnings (MAX)

- Arguments can either be numbers or names, arrays, or references that contain numbers.
- Logical values and text representations of numbers that you type directly into the list of arguments are counted.
- If an argument is an array or reference, only numbers in that array or reference are used. Empty cells, logical values, or text in the array or reference are ignored.
- If the arguments contain no numbers, MAX returns 0 (zero).
- Arguments that are error values or text that cannot be translated into numbers cause errors.
- If you want to include logical values and text representations of numbers in a reference as part of the calculation, use the MAXA function.

Warnings (MAXA)

- Arguments can be the following: numbers; names, arrays, or references that contain numbers; text representations of numbers; or logical values, such as TRUE and FALSE, in a reference.
- Logical values and text representations of numbers that you type directly into the list of arguments are counted.
- If an argument is an array or reference, only values in that array or reference are used. Empty cells and text values in the array or reference are ignored.
- Arguments that are error values or text that cannot be translated into numbers cause errors.
- Arguments that contain TRUE evaluate as 1; arguments that contain text or FALSE evaluate as 0 (zero).
- If the arguments contain no values, MAXA returns 0 (zero).
- If you do not want to include logical values and text representations of numbers in a reference as part of the calculation, use the MAX function.

37. MIN & MINA

MIN(number1, [number2], [number3], [number4], …)

Returns the smallest number in a set of values. Ignores logical values and text

MINA(value1, [value2], [value3], [value4], …)

Returns the smallest value in a set of values. Does not ignore logical values and text. MAXA function evaluates TRUE as 1, FALSE as 0 and any Text value as
0. Empty cells are ignored

N36

MIN(number1, [number2], [number3], [number4], …)

Returns the smallest number in a set of values. Ignores logical values and text

MINA(value1, [value2], [value3], [value4], …)

Returns the smallest value in a set of values. Does not ignore logical values and text. MAXA function evaluates TRUE as 1, FALSE as 0 and any Text value as 0. Empty cells are ignored

Values	Values
0.3	Excel 2013
0.5	TRUE
-2	0.9
Marissa	FALSE
10	0.78
8	0.95
15	0.25
6	0.6

Formula	Result	Remarks
=MIN(C9:C16)	0.25	In the range C9:C16, MIN function returns 0.25. It ignores the TRUE, FALSE and Text values.
=MINA(C9:C16)	0	In the same range C9:C16, MINA function returns 0. It evaluates FALSE or TEXT values as 0, and it is the smallest value in the range.
=MIN(B9:C16)	-2	In the range B9:C16, the smallest value is -2.
=MINA(B9:C16)	-2	In the range B9:C16, the smallest value is -2.

Warnings (MIN)

- Arguments can either be numbers or names, arrays, or references that contain numbers.
- Logical values and text representations of numbers that you type directly into the list of arguments are counted.
- If an argument is an array or reference, only numbers in that array or reference are used. Empty cells, logical values, or text in the array or reference are ignored.
- If the arguments contain no numbers, MIN returns 0.
- Arguments that are error values or text that cannot be translated into numbers cause errors.
- If you want to include logical values and text representations of numbers in a reference as part of the calculation, use the MINA function.

Warnings (MINA)

- Arguments can be the following: numbers; names, arrays, or references that contain numbers; text representations of numbers; or logical values, such as TRUE and FALSE, in a reference.
- If an argument is an array or reference, only values in that array or reference are used. Empty cells and text values in the array or reference are ignored.
- Arguments that contain TRUE evaluate as 1; arguments that contain text or FALSE evaluate as 0 (zero).
- Arguments that are error values or text that cannot be translated into numbers cause errors.
- If the arguments contain no values, MINA returns 0.
- If you do not want to include logical values and text representations of numbers in a reference as part of the calculation, use the MIN function.

38. MOD

MOD(number, divisor)

Returns the remainder after a number is divided by a divisor

I19

MOD(number, divisor)

Returns the remainder after a number is divided by a divisor

Formula	Result	Remarks
=MOD(25, 8)	1	The remainder will be greater than or equal to 0 and less than 8.
=MOD(25, -8)	-7	The remainder will be less than or equal to 0 and greater than -8.
=MOD(-25, 8)	7	The remainer will be less than or equal to 0 and less than 8.
=MOD(-25, -8)	-1	The remainder will be less than or equal to 0 and greater than -8.

39. RAND

RAND()

Returns a random number greater than or equal to 0 and less than 1, evenly distributed (changes on recalculation)

I23

RAND()

Returns a random number greater than or equal to 0 and less than 1, evenly distributed (changes on recalculation)

Formula	Result	Remarks
=RAND()	0.4391657	Generates any random number greater than or equal to 0 and less than 1
=RAND()	0.9685055	Generates any random number greater than or equal to 0 and less than 1
=RAND()	0.9161795	Generates any random number greater than or equal to 0 and less than 1
=RAND()	0.4478868	Generates any random number greater than or equal to 0 and less than 1

40. RANDBETWEEN

RANDBETWEEN(bottom, top)

Returns a random number between the numbers you specify

J25

RANDBETWEEN(bottom, top)

Returns a random number between the numbers you specify

Formula	Result	Remarks
=RANDBETWEEN(100, 200)	119	The formula returns a random number between 100 and 200.
=RANDBETWEEN(100, 200)	119	The formula returns a random number between 100 and 200.
=RANDBETWEEN(100, 200)	108	The formula returns a random number between 100 and 200.

41. SQRT

SQRT(number)

Returns the square root of a number

K22

SQRT(number)

Returns the square root of a number

Formula	Result	Remarks
=SQRT(49)	7	Returns the square root of number 49
=SQRT(625)	25	Returns the square root of number 625
=SQRT(50)	7.0711	Returns the square root of number 50 (*formatted up to 4 decimal points*)
=SQRT(-49)	#NUM!	Returns **#NUM!** type error as you cannot calculate the square root of a negative number.

42. SUBTOTAL

SUBTOTAL(function_num, ref1, [ref2], [ref3], …)

Returns a subtotal in a list or database

O33

SUBTOTAL(function_num, ref1, [ref2], [ref3], …)

Returns a subtotal in a list or database

function_num (Includes Hidden Values)	function_num (Ignores Hidden Values)	function
1	101	AVERAGE
2	102	COUNT
3	103	COUNTA
4	104	MAX
5	105	MIN
6	106	PRODUCT
7	107	STDEV
8	108	STDEVP
9	109	SUM
10	110	VAR
11	111	VARP

Values
15
45
78
89
65
78
45
50
65
12

Warnings

■ If there are other subtotals within ref1, ref2,… (or nested subtotals), these nested subtotals are ignored to avoid double counting.
■ For the function_num constants from 1 to 11, the SUBTOTAL function includes the values of rows hidden by the**Hide Rows** command under the **Hide & Unhide** submenu of the **Format** command in the **Cells** group on the**Home** tab in the Excel desktop application. Use these constants when you want to subtotal hidden and nonhidden numbers in a list. For the function_Num constants from 101 to 111, the SUBTOTAL function ignores values of rows hidden by the **Hide Rows** command. Use these constants when you want to subtotal only nonhidden numbers in a list.
■ The SUBTOTAL function ignores any rows that are not included in the result of a filter, no matter which function_num value you use.
■ The SUBTOTAL function is designed for columns of data, or vertical ranges. It is not designed for rows of data, or horizontal ranges. For example, when you subtotal a horizontal range using a function_num of 101 or greater, such as SUBTOTAL(109,B2:G2), hiding a column does not affect the subtotal. But, hiding a row in a subtotal of a vertical range does affect the subtotal.
■ If any of the references are 3-D references, SUBTOTAL returns the #VALUE! error value.

Formula	Result	Remarks
=SUBTOTAL(109, B19:B30)	542	This formula ignores the hidden values (row 26 and 27 are hidden) and calculates the sum of the visible rows.
=SUBTOTAL(9, B19:B30)	632	This formula includes the hidden values (row 26 and 27 are hidden) and calculates the sum of all the values in the range.
=SUBTOTAL(101, B19:B30)	54.2	Ignores the hidden values when calculating the average of range B19:B30.
=SUBTOTAL(1, B19:B30)	52.66667	Includes the hidden values when calculating the average of range B19:B30.

D. FIND & SEARCH FUNCTIONS

43. FIND

FIND(find_text, within_text, [start_num])

Returns the starting position of one text string within another text string. FIND is case-sensitive

P33

FIND(find_text, within_text, [start_num])

Returns the starting position of one text string within another text string. FIND is case-sensitive

Data
Marissa Kawser Ron

Formula	Result	Remarks
=FIND("r", B6)	3	Returns the position of the first "r" counting from position 1.
=FIND("r", B6, 1)	3	Returns the position of the first "r" counting from position 1.
=FIND("r", B6, 2)	3	Returns the position of the first "r" counting from position 2.
=FIND("r", B6, 3)	3	Returns the position of the first "r" counting from position 3.
=FIND("r", B6, 4)	14	Returns the position of the first "r" counting from position 4.
=FIND("R", B6)	16	Returns the position of the first "R" counting from position 1.

Warnings

■ FIND is case sensitive and don't allow wildcard characters. If you don't want to do a case sensitive search or use wildcard characters, you can use SEARCH.
■ If find_text is "" (empty text), FIND matches the first character in the search string (that is, the character numbered start_num or 1).
Find_text cannot contain any wildcard characters.
■ If find_text does not appear in within_text, FIND returns the #VALUE! error value.
■ If start_num is not greater than zero, FIND returns the #VALUE! error value.
■ If start_num is greater than the length of within_text, FIND returns the #VALUE! error value.
■ Use start_num to skip a specified number of characters. Using FIND as an example, suppose you are working with the text string "AYF0093.YoungMensApparel". To find the number of the first "Y" in the descriptive part of the text string, set start_num equal to 8 so that the serial-number portion of the text is not searched. FIND begins with character 8, finds find_text at the next character, and returns the number 9. FIND always returns the number of characters from the start of within_text, counting the characters you skip if start_num is greater than 1.

44. SEARCH

SEARCH(find_text, within_text, [start_num])

Returns the number of the character at which a specific character or text string is first found, reading left to right (not case-sensitive)

S39

SEARCH(find_text, within_text, [start_num])

Returns the number of the character at which a specific character or text string is first found, reading left to right (not case-sensitive)

Data
Marissa Kawser Ron
"Jon" come here
The "boss" is here

Formula	Result	Remarks
=SEARCH("r", B6)	3	Returns the position of the first "r" counting from position 1.
=SEARCH("r", B6,	3	Returns the position of the first "r" counting from position 1.
=SEARCH("r", B6,	3	Returns the position of the first "r" counting from position 2.
=SEARCH("r", B6,	3	Returns the position of the first "r" counting from position 3.
=SEARCH("r", B6,	14	Returns the position of the first "r" counting from position 4.
=SEARCH("R", B6)	3	Returns the position of the first "R" counting from position 1. "R" and "r" are same here. As SEARCH is not case-sensitive.
=SEARCH(" ", B7)	6	Position of the first space in the cell B7.
=SEARCH("""",B8)	5	Position of the first double quotes in the cell B8.

Warnings

■ The **SEARCH** functions is not case sensitive. If you want to do a case sensitive search, you can use **FIND.**
■ You can use the wildcard characters — the question mark (**?**) and asterisk (*) — in the ***find_text*** argument. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (~) before the character.
■ If the value of ***find_text*** is not found, the #VALUE! error value is returned.
■ If the ***start_num*** argument is omitted, it is assumed to be 1.
■ If ***start_num*** is not greater than 0 (zero) or is greater than the length of the ***within_text*** argument, the #VALUE! error value is returned.
■ Use ***start_num*** to skip a specified number of characters. Using the **SEARCH** function as an example, suppose you are working with the text string "AYF0093.YoungMensApparel". To find the position of the first "Y" in the descriptive part of the text string, set ***start_num*** equal to 8 so that the serial number portion of the text (in this case, "AYF0093") is not searched. The **SEARCH** function starts the search operation at the eighth character position, finds the character that is specified in the ***find_text*** argument at the next position, and returns the number 9. The **SEARCH** function always returns the number of characters from the start of the ***within_text***argument, counting the characters you skip if the ***start_num*** argument is greater than 1.

45. SUBSTITUTE

SUBSTITUTE(text, old_text, new_text, [instance_num]) Replaces existing text with new text in a text string

N25

SUBSTITUTE(text, old_text, new_text, [instance_num])

Replaces existing text with new text in a text string

Data
Quantity Sold Sold
Year 2008
Year 2009

Formula	Result	Remarks
=SUBSTITUTE(B6, "Sold", "Bought")	Quantity Bought Bought	"Sold" text is replaced by "Bought" text in every instance.
=SUBSTITUTE(B6, "Sold", "Bought", 1)	Quantity Bought Sold	"Bought" text for the first instance.
=SUBSTITUTE(B6, "Sold", "Bought", 2)	Quantity Sold Bought	"Bought" text for the second stance.
=SUBSTITUTE(B7, "08", "13")	Year 2013	"08" text is replaced by "13" text.

46. REPLACE

REPLACE(old_text, start_num, num_chars, new_text)

Replaces part of a text string with different text string

O24

REPLACE(old_text, start_num, num_chars, new_text)

Replaces part of a text string with different text string

Data
Marissa Khan
2015
9876543210

Formula	Result	Remarks
=REPLACE(B6, 9, 1, "Kawser")	Marissa Kawserhan	9th letter K is replaced by new_text Kawser.
=REPLACE(B6, 9, 2, "Kawser")	Marissa Kawseran	9th and 10th letter Kh is replaced by new_text Kawser.
=REPLACE(B6, 9, 3, "Kawser")	Marissa Kawsern	9th 10th and 11th letter Kha is replaced by new_text Kawser.
=REPLACE(B6, 9, 4, "Kawser")	Marissa Kawser	9th 10th 11th and 12th letter Khan is replaced by new_text Kawser.
=REPLACE(B6, 1, 1, "Kawser")	Kawserarissa Khan	Try to guess what is happening here.
=REPLACE(B6, 2, 2, "Kawser")	MKawserissa Khan	Try to guess what is happening here.
=REPLACE(B6, 3, 3, "Kawser")	MaKawsersa Khan	Try to guess what is happening here.
=REPLACE(B6, 4, 4, "Kawser")	MarKawser Khan	Try to guess what is happening here.

E. LOOKUP FUNCTIONS

47. MATCH

MATCH(lookup_value, lookup_array, [match_type])

Returns the relative position of an item in an array that matches a specified value in a specified order

P36

MATCH(lookup_value, lookup_array, [match_type])

Returns the relative position of an item in an array that matches a specified value in a specified order

match_type	behavior
1 or omitted	MATCH finds the largest value that is less than or equal to lookup_value. The values in thelookup_array argument must be placed in ascending order, for example: ...-2, -1, 0, 1, 2, ..., A-Z, FALSE, TRUE.
0	MATCH finds the first value that is exactly equal to lookup_value. The values in the lookup_arrayargument can be in any order.
-1	MATCH finds the smallest value that is greater than or equal tolookup_value. The values in thelookup_array argument must be placed in descending order, for example: TRUE, FALSE, Z-A, ...2, 1, 0, -1, -2, ..., and so on.

Product	Count1 (Ascending)	Count2 (Descending)	Count3 (No Order)
Apple	35	45	25
Orange	38	40	30
Banana	40	38	28
Pears	45	35	15

Formula	Result	Remarks
=MATCH(41, C11:C14, 1)	3	The array is in ascending order. And match_type is 1. The formula returns 3 as there is no value as 41 in the array. Largest value less than or equal to 41 is at position 3.
=MATCH(41, C11:C14, 0)	#N/A	There is no exact match of value 41 in the range C11: C14.
=MATCH(41, C11:C14, -1)	#N/A	The array is in descending order. So you cannot apply match_type -1 for this array.
=MATCH(41, D11:D14, -1)	1	The array is in descending order. And match_type is -1. The formula returns 1 as there is no value as 41 in the array. So the smallest value greater than or equal to 41 is at position 1.
=MATCH(28, E11:E14, 0)	3	When the values are not in a order, you have to use 0 as the match_type value.

48. LOOKUP

LOOKUP(lookup_value, lookup_vector, [result_vector])

Looks up a value either from a one-row or one-column range or from an array. Provided for backward compatibility

O23

LOOKUP(lookup_value, lookup_vector, [result_vector])

Looks up a value either from a one-row or one-column range or from an array. Provided for backward compatibility

Part Number	Serial	Part Price	Status
A001	10	200	In Stock
A002	20	500	In Stock
A003	30	300	In Stock
A004	40	150	In Stock
A005	50	225	
A006	60	525	

Formula	Result	Remarks
=LOOKUP("A003", B7:B12, D7:D12)	300	Looking up value A003 in the range B7: B12 and then showing result from range D7: D12.
=LOOKUP(20, C7:C12, D7:D12)	500	Looking up value 20 in the range C7: C12 and then showing result from range D7: D12.
=LOOKUP(25, C7:C12, D7:D12)	500	value 25. The function matches the nearest smaller values; it is 20. So the formula returns 500 as the result.
=LOOKUP(5, C7:C12, D7:D12)	#N/A	5. The function tries to match the nearest smaller values; it does not find. So the formula shows error.

Warnings

■ If the **LOOKUP** function can't find the ***lookup_value***, the function matches the largest value in ***lookup_vector***that is less than or equal to ***lookup_value***.
■ If ***lookup_value*** is smaller than the smallest value in ***lookup_vector***, **LOOKUP** returns the #N/A error value.

49. HLOOKUP

HLOOKUP(lookup_value, table_array, row_index_num, [range_lookup])

Looks for a value in the top row of a table or array of values and return the value in the same column from a row you specify

P27

HLOOKUP(lookup_value, table_array, row_index_num, [range_lookup])

Looks for a value in the top row of a table or array of values and return the value in the same column from a row you specify

Month	Axles	Bearings	Bolts
Jan	4	7	9
Feb	5	8	10
Mar	6	9	11

Formula	Result	Remarks
=HLOOKUP("Axles", B6:E9, 2, TRUE)	4	Looks up "Axles" in row 1, and returns the value from row 2 that's in the same column (column C).
=HLOOKUP("Bearings", C6:E9, 3, FALSE)	8	Looks up "Bearings" in row 1, and returns the value from row 3 that's in the same column (column D).
=HLOOKUP("B", B6:E9, 3, TRUE)	5	from row 3 that's in the same column. Because an exact match for "B" is not found, the largest value in row 1 that is less than "B" is used: "Axles," in column C.

Warnings

■ If HLOOKUP can't find lookup_value, and range_lookup is TRUE, it uses the largest value that is less than lookup_value.
■ If lookup_value is smaller than the smallest value in the first row of table_array, HLOOKUP returns the #N/A error value.
■ If range_lookup is FALSE and lookup_value is text, you can use the wildcard characters, question mark (?) and asterisk (*), in lookup_value. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (~) before the character.

50. VLOOKUP

VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])

Looks for a value in the leftmost column in a table, then returns a value in the same row from a column you specify. By default, the table must be sorted in an ascending order

Q20

VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])

Looks for a value in the leftmost column in a table, then returns a value in the same row from a column you specify. By default, the table must be sorted in an ascending order

ID	Last name	First name	Title	Birth date
101	Davis	Sara	Sales Rep.	8/12/1968
105	Fontana	Olivier	V.P. of Sal	2/19/1952
108	Leal	Karina	Sales Rep.	8/30/1963
111	Patten	Michael	Manager	9/19/1958
115	Burke	Brian	Sales Mgr	4/3/1955
120	Sousa	Luis	Sales Rep.	2/7/1963

Formula	Result	Remarks
=VLOOKUP("Leal", C7:F12, 3, FALSE)	Sales Rep.	In the range C59: F64, the formula looks up "Leal" in the first column, when found it shows the Title of Leal at 3rd column in the same row. FALSE returns an exact match.
=VLOOKUP(111, B7:F12, 5, FALSE)	9/19/1958	In the range B59: F64, the formula looks up value 111 in the frist column, when found it shows the Birth Date at 5th column in the same row. FALSE returns an exact match.
=VLOOKUP(110, B7:F12, 4, FALSE)	#N/A	There is no ID as 110 in the first column of range B59: F64 and the VLOOKUP function will return an exact match. So the function returns #N/A.
=VLOOKUP(114, B7:F12, 4, TRUE)	Manager	There is no ID as 114 in the first column of range B59: F64, but the VLOOKUP function will return an appropriate match, VLOOKUP function returns the Title of ID 111. 111 is the nearest value of 114 and less than 114.

F. REFERENCE FUNCTIONS

51. ADDRESS

ADDRESS(row_num, column_num, [abs_num], [a1], [sheet_text])

Creates a cell reference as text, given specified row and column

numbers

M18

ADDRESS(row_num, column_num, [abs_num], [a1], [sheet_text])

Creates a cell reference as text, given specified row and column numbers

abs_num	Returns this type of reference
1 or Omitted	Absolute
2	Absolute Row/ Relative Column
3	Relative Row/ Absolute Column
4	Relative

Formula	Result	Remarks
=ADDRESS(2,3)	C2	Absolute and A1-style reference
=ADDRESS(2,3,2)	C$2	Absolute Row, Relative Column and A1-style cell reference.
=ADDRESS(2,3,2,FALSE)	R2C[3]	Absolute Row, Relative Column and R1C1 style cell reference.
=ADDRESS(2,3,1,FALSE,"[Book1]Sheet1")	[Book1]Sheet1!R2C3	Absolute and R1C1 style cell reference with workbook and sheet name.
=ADDRESS(2,3,4,FALSE,"EXCEL SHEET")	'EXCEL SHEET'!R[2]C[3]	Relative and R1C1 style cell referecne with Worksheet name.

a1	Reference Style
TRUE or Omitted	A1 Style
FALSE	R1C1 Style

52. CHOOSE

CHOOSE(index_num, value1, [value2], [value3], …)

Chooses a value or action to perform from a list of values, based on an index number

CHOOSE(index_num, value1, [value2], [value3], ...)

Chooses a value or action to perform from a list of values, based on an index number

Data
Marissa
Excel
Excel BI
Power Query
Power Pivot
Power Map

Formula	Result	Remarks
=CHOOSE(3, B7, B8, B9, B10, B11, B12)	Excel BI	Value of the 3rd list argument (value of cell B23)
=CHOOSE(5, B7, B8, B9, B10, B11, B12)	Power Pivot	Value of the 5th list argument (value of cell B25)

Warnings

■ If index_num is an array, every value is evaluated when CHOOSE is evaluated.
■ The value arguments to CHOOSE can be range references as well as single values.
For example, the formula:
=SUM(CHOOSE(2,A1:A10,B1:B10,C1:C10))
evaluates to:
=SUM(B1:B10)

53. INDEX

Array Form: INDEX(array, row_num, [column_num])

Return the value of a specified cell or array of cells

Array Form: INDEX(array, row_num, [column_num])

Return the value of a specified cell or array of cells

Data	Data
Apples	Lemons
Bananas	Pears

Formula	Result	Remarks
=INDEX(B7:C8, 2, 2)	Pears	INDEX function in Array format.
{=INDEX(B7:C8, 0, 1)}	Apples	INDEX function in Array format and entered as Array formula. Returns the entire 1st column of the range.
	Bananas	INDEX function in Array format and entered as Array formula. Returns the entire 1st column of the range.

Warnings (Array Form)

■ If both the Row_num and Column_num arguments are used, INDEX returns the value in the cell at the intersection of Row_num and Column_num.
■ If you set Row_num or Column_num to 0 (zero), INDEX returns the array of values for the entire column or row, respectively.
■ To use values returned as an array, enter the INDEX function as an array formula in a horizontal range of cells for a row, and in a vertical range of cells for a column. To enter an array formula, press CTRL+SHIFT+ENTER.
NOTE In Excel Web App, you cannot create array formulas.
■ Row_num and Column_num must point to a cell within array; otherwise, INDEX returns the #REF! error value.

Reference Form: INDEX(reference, row_num, [column_num], [area_num])

Returns a reference to specified cells

Reference Form:	INDEX(reference, row_num, [column_num], [area_num])

Returns a reference to specified cells

Fruit Category 1	Price	Count
Apples	$ 0.69	40
Bananas	$ 0.34	38
Lemons	$ 0.55	15
Oranges	$ 0.25	25
Pears	$ 0.59	40

Fruit Category 2	Price	Count
Almonds	$ 2.80	10
Cashews	$ 3.55	16
Peanuts	$ 1.25	20
Walnuts	$ 1.75	12

Formula	Result	Remarks
=INDEX(B7:D11, 3, 3)	$ 15.00	The intersection of the 3rd row and 3rd column in the range B7: D11. Returns the cell reference D9. D9 has value 15, so the formula returns 15
=INDEX((B7:D11, B14:D17), 3, 2, 2)	$ 1.25	The intersection of the 3rd row and 2nd column in the range B14: D17 as area_num is 2. Returns the cell reference C16. C16 has value 1.25. So the formula returns 1.25 value.
=SUM(D7:INDEX(B7:D11,5,3))	$ 158.00	INDEX part of this formula returns cell reference D11. SUM function returns the sum of range D7: D11.

Warnings (Reference Form)

■ After Reference and Area_num have selected a particular range, Row_num and Column_num select a particular cell: Row_num 1 is the first row in the range, Column_num 1 is the first column, and so on. The reference returned by INDEX is the intersection of Row_num and Column_num.

■ If you set Row_num or Column_num to 0 (zero), INDEX returns the reference for the entire column or row, respectively.

■ Row_num, Column_num, and Area_num must point to a cell within reference; otherwise, INDEX returns the #REF! error value. If Row_num and Column_num are omitted, INDEX returns the area in reference specified by Area_num.

■ The result of the INDEX function is a reference and is interpreted as such by other formulas. Depending on the formula, the return value of INDEX may be used as a reference or as a value. For example, the formula CELL("width",INDEX(A1:B2,1,2)) is equivalent to CELL("width",B1). The CELL function uses the return value of INDEX as a cell reference. On the other hand, a formula such as 2*INDEX(A1:B2,1,2) translates the return value of INDEX into the number in cell B1.

NOTE The CELL function is not available in Excel Web App.

54. INDIRECT

INDIRECT(ref_text, [a1])

Returns the reference specified by a text string

INDIRECT(ref_text, [a1])

Returns the reference specified by a text string

Data	Values
C7	Marissa
C8	Kawser
C9	Excel
Sales_Data	$90,000.00
11	$ 850.00

Formula	Result	Remarks
=@INDIRECT(B7)	Marissa	In cell B7, there is a cell reference C7. C7 holds data Marissa. So the formula returns Marissa.
=@INDIRECT("C8")	Kawser	INDIRECT function is directly referring to cell C8.
=@INDIRECT(B9)	Excel	Same as the first formula.
=@INDIRECT(B10)	$ 90,000.00	In cell B10, there is a named range Sales_Data. Sales_Data refers to cell C10. C10 has value 90000. So the formula returns 90000.
=@INDIRECT("C"&B11)	$ 850.00	"C"&B11 returns C11 as B11 cell has value 11. C11 cell has value 850. So the formula returns 850.
=SUM(INDIRECT("C10:C11"))	$ 90,850.00	INDIRECT function is directly referring to cell range C10: C11.

55. OFFSET

OFFSET(reference- rows, cols, [height], [width])

Returns a reference to a range that is a given number of rows and columns from a given reference

K33

OFFSET(reference- rows, cols, [height], [width])

Returns a reference to a range that is a given number of rows and columns from a given reference

Data	Data	Data
15	25	8
20	31	7
25	12	9
9	18	15
11	18	14
18	10	16
18	20	17
15	15	36

Formula	Result	Remarks
=OFFSET(B10, -2, 2, 1, 1)	7	Reference point is cell B10. Then goes 2 cells up and reach cell B8, then go 2 cells right and reach cell D8, the height and width is 1 and 1. So the formula returns 7
=SUM(OFFSET(B12, -3, 1, 2,2))	54	Sum of the cells of the range C9: D10
=SUM(OFFSET(B7, 0, 0, 8, 3))	402	Sum of all the cells in the range B7: D14

Warnings

- If rows and cols offset reference over the edge of the worksheet, OFFSET returns the #REF! error value.
- If height or width is omitted, it is assumed to be the same height or width as reference.
- OFFSET doesn't actually move any cells or change the selection; it just returns a reference. OFFSET can be used with any function expecting a reference argument. For example, the formula SUM(OFFSET(C2,1,2,3,1)) calculates the total value of a 3-row by 1-column range that is 1 row below and 2 columns to the right of cell C2.

G. DATE & TIME FUNCTIONS

56. DATE

DATE(year, month, day)

Returns the number that represents the date in Microsoft Excel date-time code

K20

DATE(year, month, day)

Returns the number that represents the date in Microsoft Excel date-time code

Year	Month	Day
2015	10	15
2010	5	25
1805	8	23

Formula	Result	Remarks
=DATE(B7, C7, D7)	10/15/2015	The formula returns the date in DDMMYY format that I am using. In your PC, the result might be MMDDYY
=DATE(2010, C8, D8)	5/25/2010	The formula returns the date in DDMMYY format that I am using. In your PC, the result might be MMDDYY
=DATE(B9, C9, D9)	8/23/3705	system only counts dates from Jan 01, 1900.

57. DATEVALUE

DATEVALUE(date_text)

Converts a date in the form of text to a number that represents the date in the Microsoft Excel date-time code

I28

DATEVALUE(date_text)

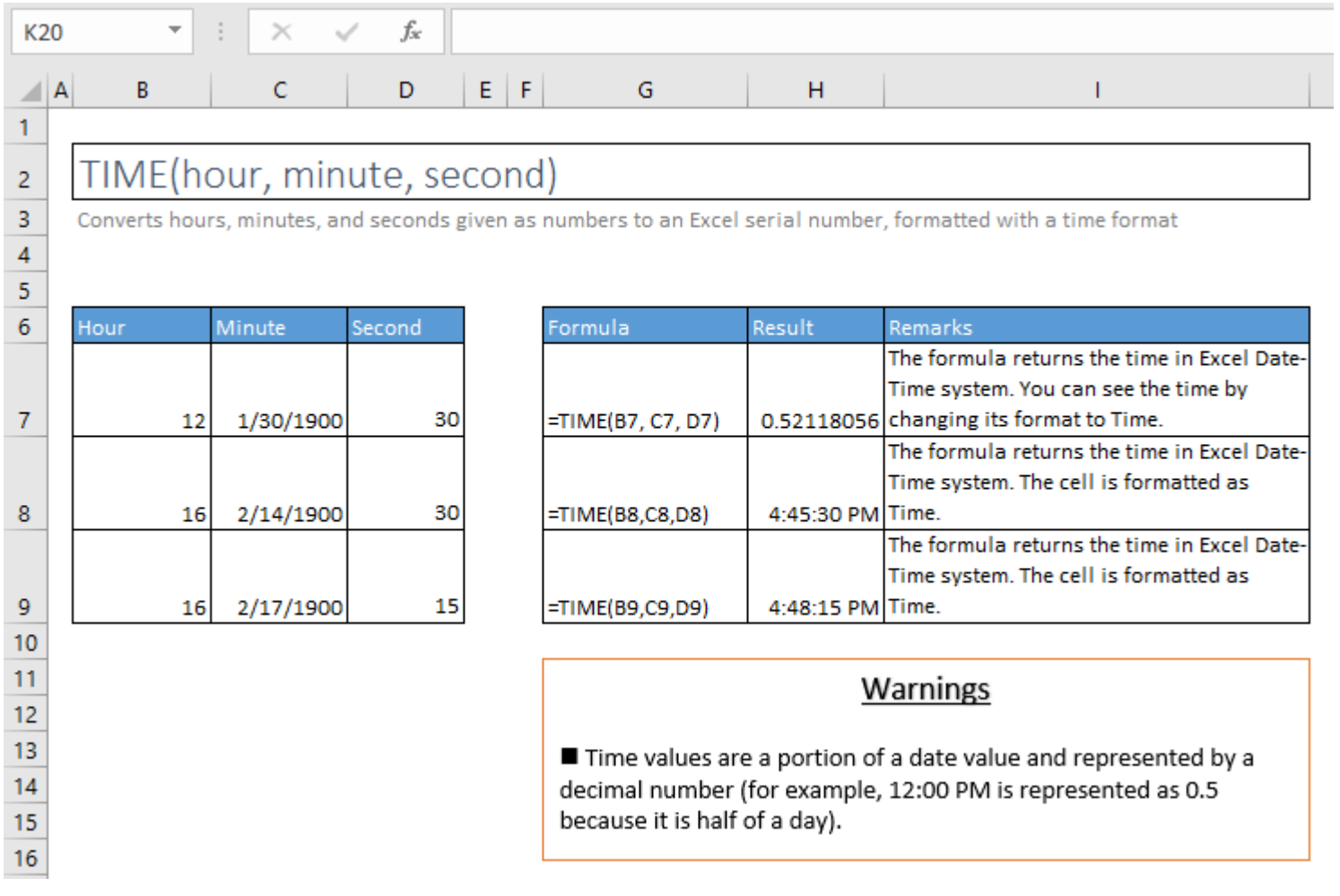
Converts a date in the form of text to a number that represents the date in the Microsoft Excel date-time code

Formula	Result	Remarks
=DATEVALUE("10/25/2015")	10/25/2015	Converts the date "10/25/2015" into the Excel Date-Time system equivalent number.
=DATEVALUE("22 May 2015")	5/22/2015	Converts the date "22 May 2015" into the Excel Date-Time system equivalent number.
=DATEVALUE("22-May-2015")	5/22/2015	Converts the date "22-May-2015" into the Excel Date-Time system equivalent number.

58. TIME

TIME(hour, minute, second)

Converts hours, minutes, and seconds given as numbers to an Excel serial number, formatted with a time format



59. TIMEVALUE

TIMEVALUE(time_text)

Converts a text time to an Excel serial number for a time, a number from 0 (12:00:00 AM) to 0.999988424 (11:59:59 PM). Format the number with a time format after entering the formula

I25

TIMEVALUE(time_text)

Converts a text time to an Excel serial number for a time, a number from 0 (12:00:00 AM) to 0.999988424 (11:59:59 PM). Format the number with a time format after entering the formula

Formula	Result	Remarks
=TIMEVALUE("2:50 PM")	2:50:00 PM	Converting the time in text format into Excel Date-Time format. The cell is formatted into Time format.
=TIMEVALUE("22-August-2015 2:50 PM")	0.618055556	This formula only extracts the time part from the text and converts it into Excel Date-Time format. The cell is formatted as General.

Warnings

- Date information in time_text is ignored.
- Time values are a portion of a date value and represented by a decimal number (for example, 12:00 PM is represented as 0.5 because it is half of a day).

60. NOW

NOW()

Returns the current date and time formatted as a date and time

I29

NOW()

Returns the current date and time formatted as a date and time

Formula	Result	Remarks
=NOW()	9/9/2021 12:45	Shows the current date and time.
=NOW()+7	9/16/2021 12:45	Returns the date and time 7 days in the future.

Warnings

- Excel stores dates as sequential serial numbers so that they can be used in calculations. By default, January 1, 1900 is serial number 1, and January 1, 2008 is serial number 39448 because it is 39,447 days after January 1, 1900.
- Numbers to the right of the decimal point in the serial number represent the time; numbers to the left represent the date. For example, the serial number 0.5 represents the time 12:00 noon.
- The results of the **NOW** function change only when the worksheet is calculated or when a macro that contains the function is run. It is not updated continuously.

61. TODAY

TODAY()

Returns the current date formatted as a date

I26

TODAY()

Returns the current date formatted as a date

Formula	Result	Remarks
	9/9/2021	Returns the current date.
	9/16/2021	Returns the current date plus 5 days.

62. YEAR(), MONTH(), DAY(), HOUR(), MINUTE(), SECOND()

YEAR(), MONTH(), DAY(), HOUR(), MINUTE() and SECOND() Functions

All these functions take one argument: serial_number

H32

YEAR(), MONTH(), DAY(), HOUR(), MINUTE() and SECOND() Functions

All of these functions take one argument: serial_number

Function Name	What it does	Formula	Result
		=NOW()	9/9/2021 13:08
YEAR(...)	Returns the year of a date, an integer in the range 1900-9999	=YEAR(NOW())	2021
MONTH(...)	Returns the month, a number from 1 (January) to 12 (December)	=MONTH(NOW())	9
DAY(...)	Returns the day of the month, a number from 1 to 31	=DAY(NOW())	9
HOUR(...)	Returns the hour as a number from 0 (12:00 A. M.) to 23(11: 00 P. M.)	=HOUR(NOW())	13
MINUTE(...)	Returns the minute, a number from 0 to 59	=MINUTE(NOW())	8
SECOND(...)	Returns the second, a number from 0 to 59	=SECOND(NOW())	21

Warnings

■ Microsoft Excel stores dates as sequential serial numbers so they can be used in calculations. By default, January 1, 1900 is serial number 1, and January 1, 2008 is serial number 39448 because it is 39,448 days after January 1, 1900.

■ Values returned by the YEAR, MONTH and DAY functions will be Gregorian values regardless of the display format for the supplied date value. For example, if the display format of the supplied date is Hijri, the returned values for the YEAR, MONTH and DAY functions will be values associated with the equivalent Gregorian date.

63. WEEKDAY

WEEKDAY(serial_number, [return_type])

Returns a number from 1 to 7 identifying the day of the week from a date

L31

WEEKDAY(serial_number, [return_type])

Returns a number from 1 to 7 identifying the day of the week from a date

return_type	What it does
1 or omitted	Numbers 1 (Sunday) through 7 (Saturday). Behaves like previous versions of Microsoft Excel.
2	Numbers 1 (Monday) through 7 (Sunday)
3	Numbers 0 (Monday) through 6 (Sunday)
11	Numbers 1 (Monday) through 7 (Sunday)
12	Numbers 1 (Tuesday) through 7 (Monday)
13	Numbers 1 (Wednesday) through 7 (Tuesday)
14	Numbers 1 (Thursday) through 7 (Wednesday)
15	Numbers 1 (Friday) through 7 (Thursday)
16	Numbers 1 (Saturday) through 7 (Friday)
17	Numbers 1 (Sunday) through 7 (Saturday)

Formula	Result	Remarks
=WEEKDAY(NOW())	5	No return type is passed. So it evaluates Sunday as 1, Monday as 2 and so on.
=WEEKDAY(NOW(), 16)	6	Return type is 16, so the function evaluates Saturday as 1, Sunday as 2 and so on.

Warnings

■ Microsoft Excel stores dates as sequential serial numbers so they can be used in calculations. By default, January 1, 1900 is serial number 1, and January 1, 2008 is serial number 39448 because it is 39,448 days after January 1, 1900.
■ If serial_number is out of range for the current date base value, a #NUM! error is returned.
■ If return_type is out of the range specified in the table above, a #NUM! error is returned.

64. DAYS

DAYS(end_date, start_date)

Returns the number of days between the two dates

N27

DAYS(end_date, start_date)

Returns the number of days between the two dates

End Date	Start Date
11/2/2015	7/12/1981

Formula	Result	Remarks
=DAYS(B7, C7)	12531	Returns the difference between two dates in days.
=DAYS("2 Nov 2015", "12 July 1981")	12531	Returns the difference between two dates in days.

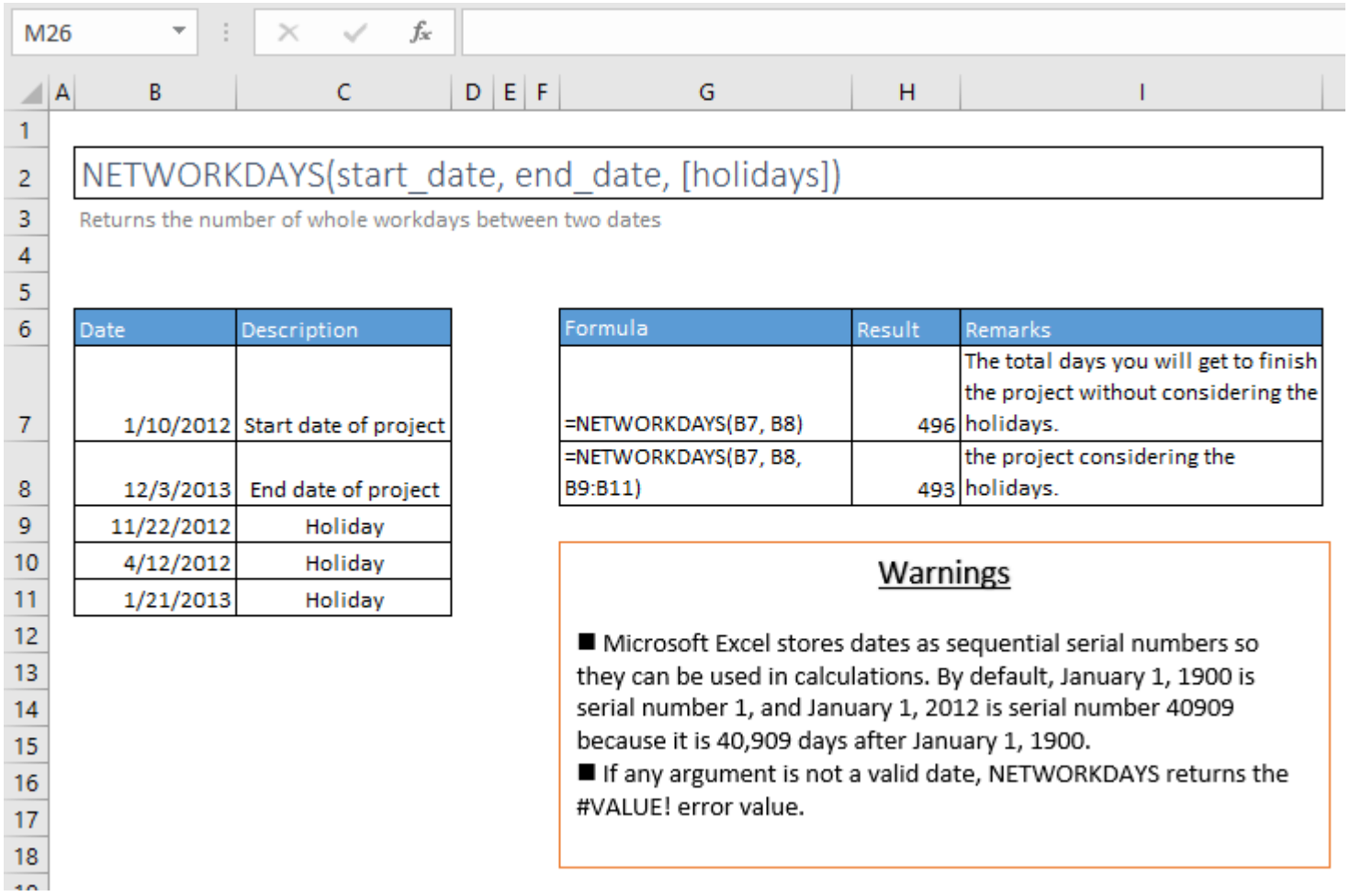
Warnings

■ If both date arguments are numbers, DAYS uses EndDate–StartDate to calculate the number of days in between both dates.
■ If either one of the date arguments is text, that argument is treated as DATEVALUE(date_text) and returns an integer date instead of a time component.
■ If date arguments are numeric values that fall outside the range of valid dates, DAYS returns the #NUM! error value.
■ If date arguments are strings that cannot be parsed as valid dates, DAYS returns the #VALUE! error value.

65. NETWORKDAYS

NETWORKDAYS(start_date, end_date, [holidays])

Returns the number of whole workdays between two dates



NETWORKDAYS(start_date, end_date, [holidays])

Returns the number of whole workdays between two dates

Date	Description
1/10/2012	Start date of project
12/3/2013	End date of project
11/22/2012	Holiday
4/12/2012	Holiday
1/21/2013	Holiday

Formula	Result	Remarks
=NETWORKDAYS(B7, B8)	496	The total days you will get to finish the project without considering the holidays.
=NETWORKDAYS(B7, B8, B9:B11)	493	the project considering the holidays.

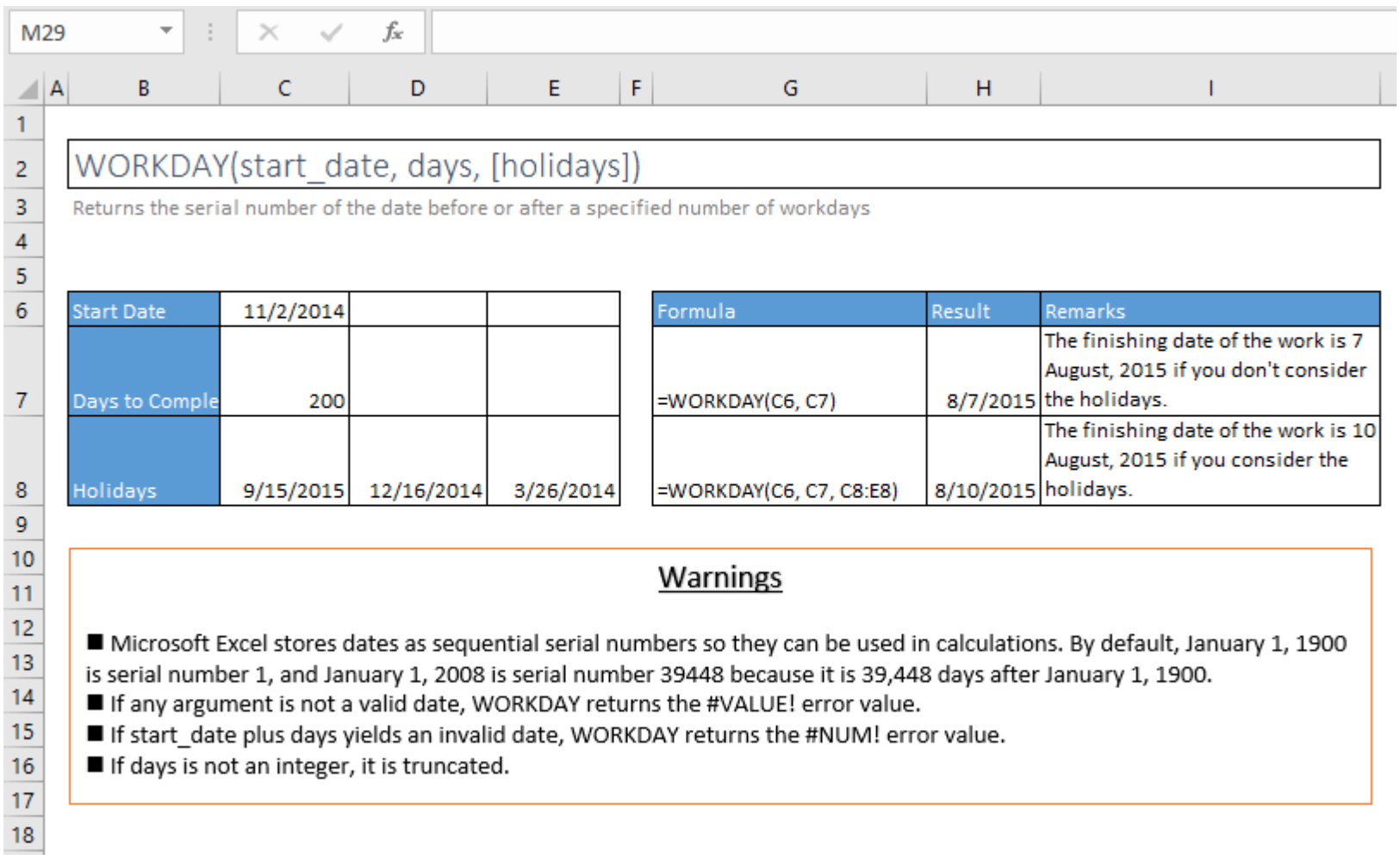
Warnings

- Microsoft Excel stores dates as sequential serial numbers so they can be used in calculations. By default, January 1, 1900 is serial number 1, and January 1, 2012 is serial number 40909 because it is 40,909 days after January 1, 1900.
- If any argument is not a valid date, NETWORKDAYS returns the #VALUE! error value.

66. WORKDAY

WORKDAY(start_date, days, [holidays])

Returns the serial number of the date before or after a specified number of workdays



WORKDAY(start_date, days, [holidays])

Returns the serial number of the date before or after a specified number of workdays

Start Date	11/2/2014		
Days to Comple	200		
Holidays	9/15/2015	12/16/2014	3/26/2014

Formula	Result	Remarks
=WORKDAY(C6, C7)	8/7/2015	The finishing date of the work is 7 August, 2015 if you don't consider the holidays.
=WORKDAY(C6, C7, C8:E8)	8/10/2015	The finishing date of the work is 10 August, 2015 if you consider the holidays.

Warnings

- Microsoft Excel stores dates as sequential serial numbers so they can be used in calculations. By default, January 1, 1900 is serial number 1, and January 1, 2008 is serial number 39448 because it is 39,448 days after January 1, 1900.
- If any argument is not a valid date, WORKDAY returns the #VALUE! error value.
- If start_date plus days yields an invalid date, WORKDAY returns the #NUM! error value.
- If days is not an integer, it is truncated.

H. MISCELLANEOUS FUNCTIONS

67. AREAS

AREAS(reference)

Returns the number of areas in a reference. An area is range of contiguous cells or a single cell

Formula	Result	Remarks
=AREAS(B3:D5)	1	Number of areas in the range
=AREAS((B3:D5,E6,F7:I10))	3	Number of areas in the range
=AREAS(B3:D5 B3)	1	Number of areas in the range

68. CHAR

CHAR(number)

Returns the character specified by the code number from the character set for your computer

Formula	Result	Remarks
=CHAR(65)	A	Displays the character represented by 65 in the computer's character set.
=CHAR(33)	!	Displays the character represented by 33 in the computer's character set.

69. CODE

CODE(text)

Returns a numeric code for the first character in a text string, in the character set used by your computer

Formula	Result	Remarks
=CODE("A")	65	Returns the numeric code of character A
=CODE("Marissa")	77	Returns the numeric code of the first character M of Marissa text
=CODE("!")	33	Returns the numeric code of character !
=CODE("?")	63	Returns the numeric code of character ?

70. CLEAN

CLEAN(text)

Removes all non-printable characters from text. Examples of Non-Printable Characters are: Tab, New Line characters. Their codes are 9 and 10.

P21

CLEAN(text)

Removes all non-printable characters from text. Examples of Non-Printable Characters are: Tab, New Line characters. Their codes are 9 and 10

Data	Formula	Result	Remarks
Sales Data	=CLEAN(B7)	Sales Data	This formula cleans up the TAB and NEW LINE non-printable characters from the text.

71. TRIM

TRIM(text)

Removes all spaces from a text string except for single spaces between words

N24

TRIM(text)

Removes all spaces from a text string except for single spaces between words

Data	Formula	Result	Remarks
Excel Dashboard	=TRIM(B7)	Excel Dashboard	Removes all the spaces except for single spaces between words
Titas Gas	=TRIM(" Titas Gas ")	Titas Gas	Removes all the spaces except for single spaces between words

72. LEN

LEN(text)

Returns the number of characters in a text string

N27

LEN(text)

Returns the number of characters in a text string

Data	Formula	Result	Remarks
Microsoft Excel	=LEN(B7)	15	Total 15 characters in the cell B7
	=LEN(B8)	0	No characters in the cell B8
	=LEN(B9)	4	4 Space characters in the cell B9
One	=LEN(B11)	10	Before Marissa there are 3 space characters.
Marissa			

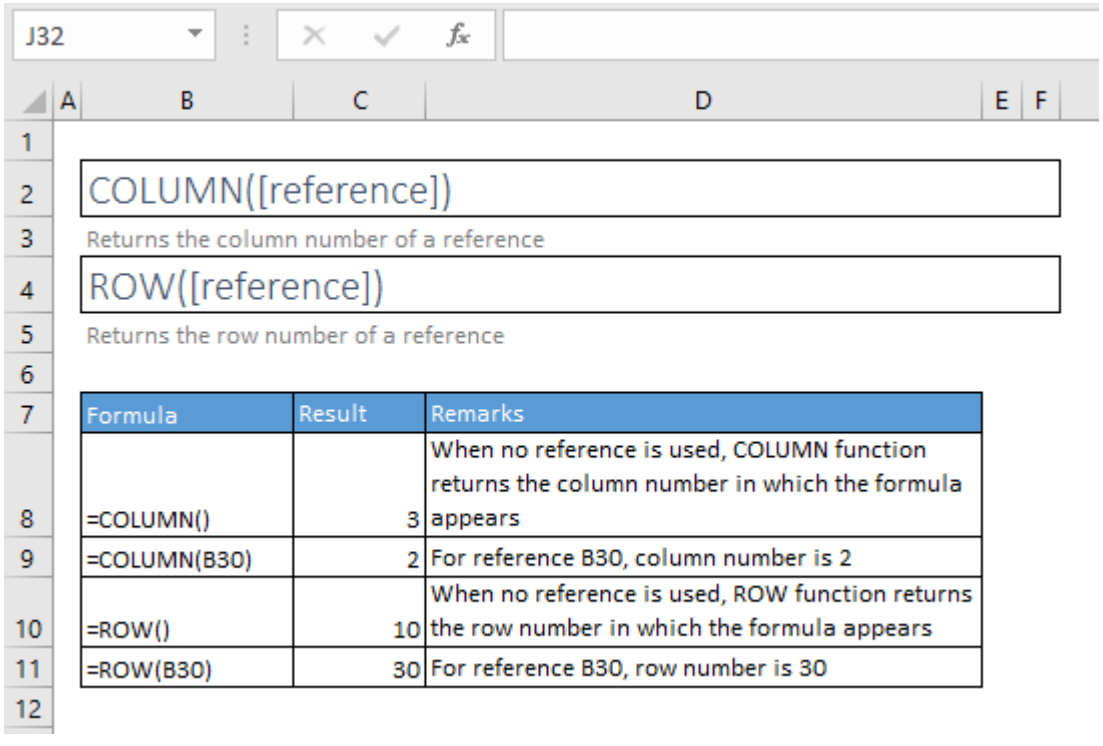
73. COLUMN() & ROW() Functions

COLUMN([reference])

Returns the column number of a reference

ROW([reference])

Returns the row number of a reference



COLUMN([reference])

Returns the column number of a reference

ROW([reference])

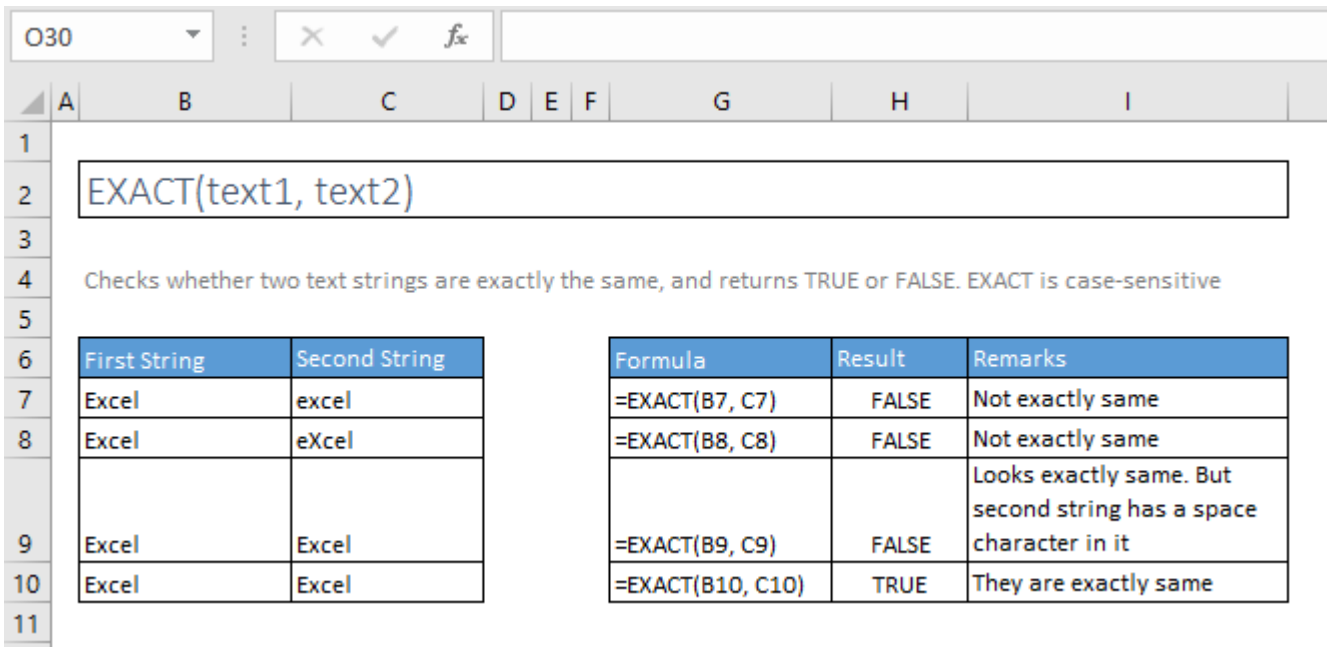
Returns the row number of a reference

Formula	Result	Remarks
=COLUMN()	3	When no reference is used, COLUMN function returns the column number in which the formula appears
=COLUMN(B30)	2	For reference B30, column number is 2
=ROW()	10	When no reference is used, ROW function returns the row number in which the formula appears
=ROW(B30)	30	For reference B30, row number is 30

74. EXACT

EXACT(text1, text2)

Checks whether two text strings are exactly the same, and returns TRUE or FALSE. EXACT is case-sensitive



EXACT(text1, text2)

Checks whether two text strings are exactly the same, and returns TRUE or FALSE. EXACT is case-sensitive

First String	Second String
Excel	excel
Excel	eXcel
Excel	Excel
Excel	Excel

Formula	Result	Remarks
=EXACT(B7, C7)	FALSE	Not exactly same
=EXACT(B8, C8)	FALSE	Not exactly same
=EXACT(B9, C9)	FALSE	Looks exactly same. But second string has a space character in it
=EXACT(B10, C10)	TRUE	They are exactly same

75. FORMULATEXT

FORMULATEXT(reference)

Returns a formula as a string

N32

FORMULATEXT(reference)

Returns a formula as a string

Formulas
80
9/9/2021 14:24
9/9/2021

Formula	Result	Remarks
=FORMULATEXT(B7)	=SUM(5, 10, 15, 50)	The formula returns the formula in cell B7 as a text string
=FORMULATEXT(B8)	=NOW()	The formula returns the formula in cell B8 as a text string
=FORMULATEXT(B9)	=TODAY()	The formula returns the formula in cell B9 as a text string

Warnings

- The FORMULATEXT function returns what is displayed in the formula bar if you select the referenced cell.
- The Reference argument can be to another worksheet or workbook.
- If the Reference argument is to another workbook that is not open, FORMULATEXT returns the #N/A error value.
- If the Reference argument is to an entire row or column, or to a range or defined name containing more than one cell, FORMULATEXT returns the value in the upper leftmost cell of the row, column, or range.
- In the following cases, FORMULATEXT returns the #N/A error value:
    - The cell used as the Reference argument does not contain a formula.
    - The formula in the cell is longer than 8192 characters.
    - The formula can't be displayed in the worksheet; for example, due to worksheet protection.
    - An external workbook that contains the formula is not open in Excel.
- Invalid data types used as inputs will produce a #VALUE! error value.
- Entering a reference to the cell in which you are entering the function as the argument won't result in a circular reference warning. FORMULATEXT will successfully return the formula as text in the cell.

76. LEFT(), RIGHT(), and MID() Functions

LEFT(text, [num_chars])

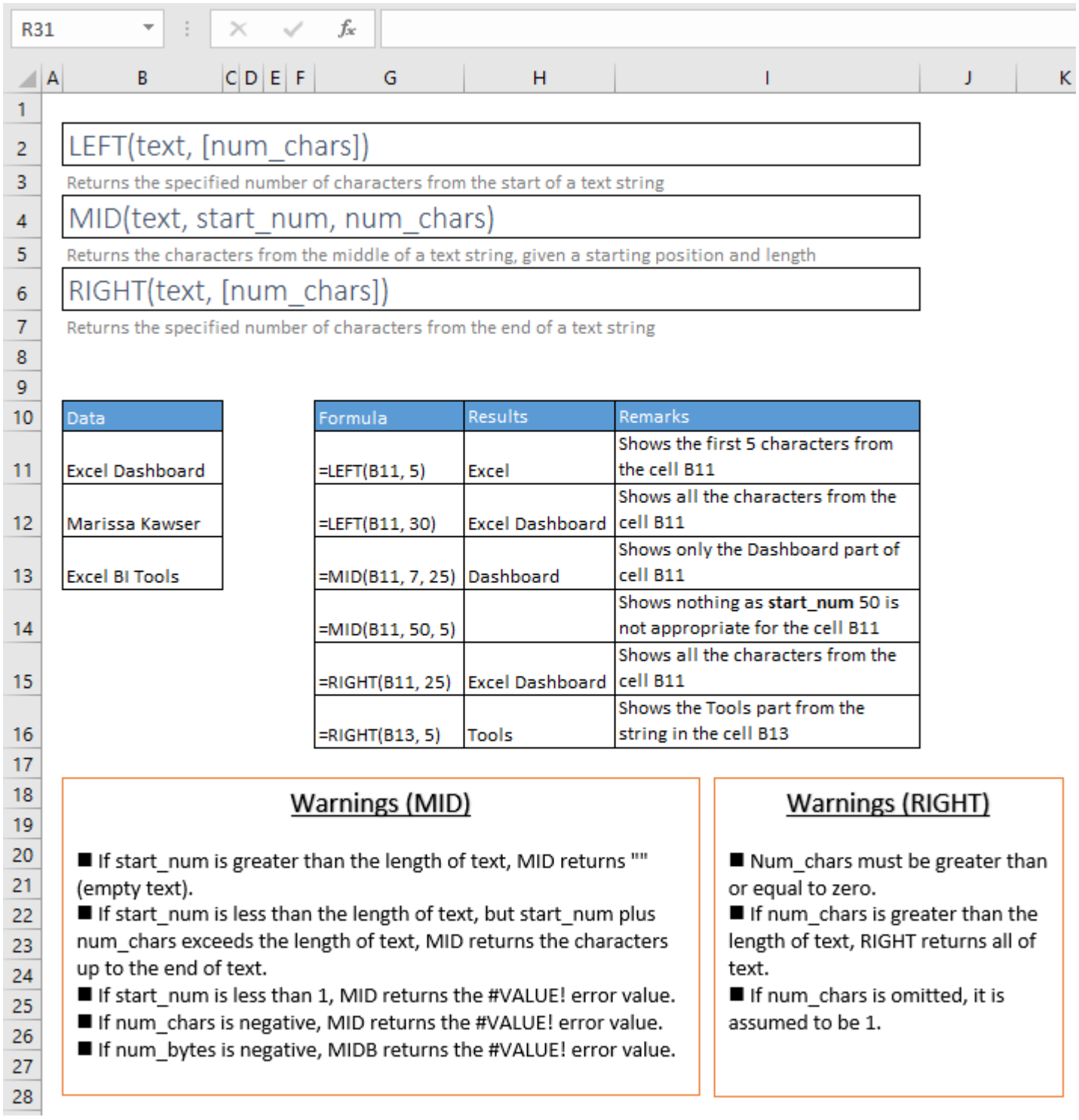
Returns the specified number of characters from the start of a text string

MID(text, start_num, num_chars)

Returns the characters from the middle of a text string, given a starting position and length

RIGHT(text, [num_chars])

Returns the specified number of characters from the end of a text string



77. LOWER(),

LOWER(text)

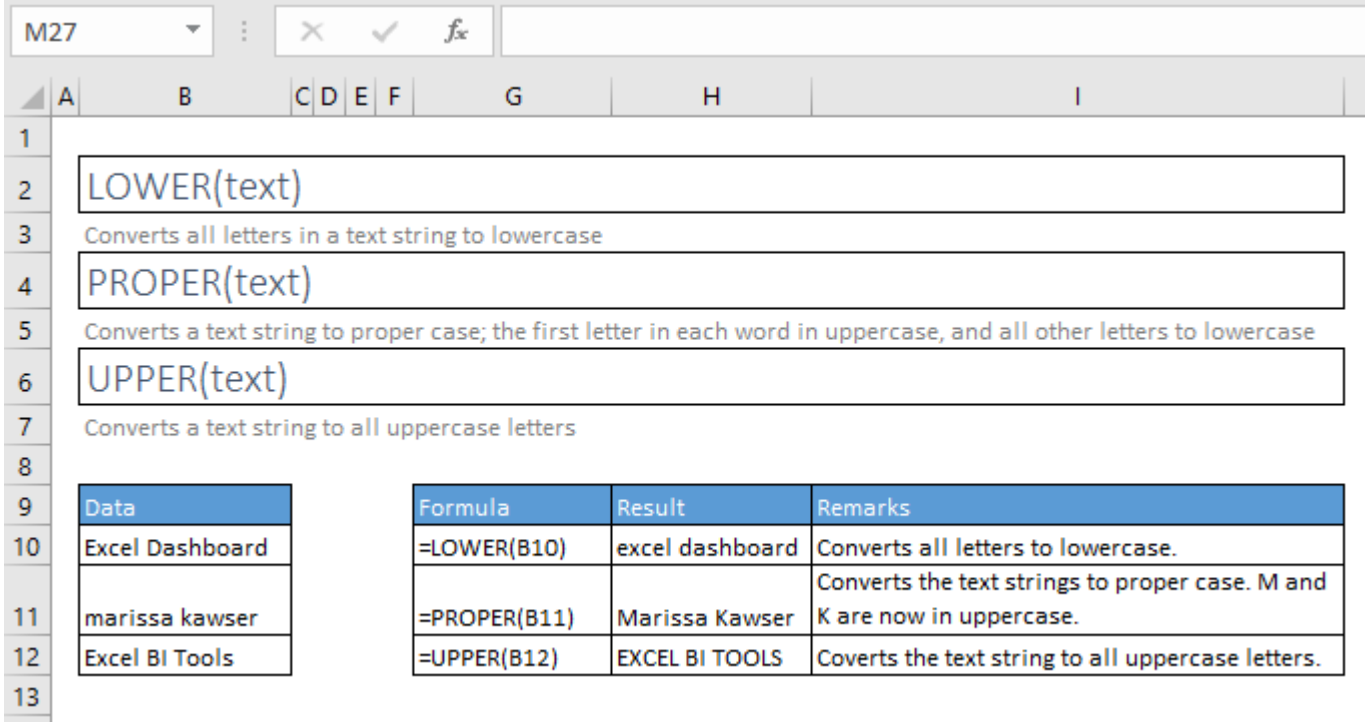
Converts all letters in a text string to lowercase

PROPER(text)

Converts a text string to proper case; the first letter in each word in uppercase, and all other letters to lowercase

UPPER(text)

Converts a text string to all uppercase letters



78. REPT

REPT(text, number_times)

Repeats text a given number of times. Use REPT to fill a cell with a number of instances of a text string

P20

	A	B	C	D	E	F	G	H	I
1									
2		REPT(text, number_times)							
3		Repeats text a given number of times. Use REPT to fill a cell with a number of instances of a text string							
4									
5		Formula	Result	Remarks					
6		=REPT("*-", 3)	*-*-*-	Fills the cell with 3 number of instances using *- string.					
7		=REPT("-",10)	----------	Fills the cell with 10 number of instances using - letter.					
8									
9		Warnings							
10									
11		■ If number_times is 0 (zero), REPT returns "" (empty text).							
12		■ If number_times is not an integer, it is truncated.							
13		■ The result of the REPT function cannot be longer than 32,767 characters, or REPT returns #VALUE!.							
14									
15									
16									

79. SHEET

SHEET([value])

Returns the sheet number of the referenced sheet

N27

	A	B	C	D	E	F	G	H	I	J	K
1											
2		SHEET([value])									
3		Returns the sheet number of the referenced sheet									
4		The SHEET function syntax has the following arguments.									
5		■ **Value** Optional. Value is the name of a sheet or a reference for which you want the sheet number. If value is									
6		omitted, SHEET returns the number of the sheet that contains the function.									
7											
8		Sheet			Formula		Result	Remarks			
9		LIST OF FUNCTIONS			=SHEET("LIST OF FUNCTIONS")		2	Showing the Sheet number of "LIST OF FUNCTIONS" worksheet.			
10		List of Functions			=SHEET()		3	Showing the Sheet number of the current worksheet.			
11		RANK			=SHEET(Sales_Data)		3	Showing the Sheet number where the Sales_Data named range available.			
12					=SHEET("Date & Time")		5	Showing the Sheet number of DATE & TIME worksheet.			
13											
14		Warnings									
15											
16		■ SHEET includes all worksheets (visible, hidden, or very hidden) in addition to all other sheet types (macro, chart, or dialog sheets).									
17		■ If the value argument is not a valid value, SHEET returns the #REF! error value. For example,									
18		=SHEET(Sheet1!#REF) will return the #REF! error value.									
19		■ If the value argument is a sheet name that is not valid, SHEET returns the #NA error value. For									
20		example =SHEET("badSheetName") will return the #NA error value.									
21		■ SHEET is not available in the Object Model (OM) because the Object Model already includes similar									
22		functionality.									
23											
24											

ISBLANK | LIST OF FUNCTIONS | SHEET() | RANK | Date & Time

80. SHEETS

SHEETS([reference])

Returns the number of sheets in a reference

O23

SHEETS([reference])

Returns the number of sheets in a reference

The SHEETS function syntax has the following arguments.

■ **Value** Reference Optional. Reference is a reference for which you want to know the number of sheets it contains. If Reference is omitted, SHEETS returns the number of sheets in the workbook that contains the function.

Formula	Result	Remarks
=SHEETS()	5	The formula returns the total number of worksheets in this workbook.

Warnings

■ SHEETS includes all worksheets (visible, hidden, or very hidden) in addition to all other sheet types (macro, chart, or dialog sheets).
■ If reference is not a valid value, SHEETS returns the #REF! error value.
■ SHEETS is not available in the Object Model (OM) because the Object Model already includes similar functionality.

ISBLANK | LIST OF FUNCTIONS | SHEET() | RANK | Date & Time

81. TRANSPOSE

TRANSPOSE(array)

Converts a vertical range of cells to a horizontal range, or vice versa

N24

TRANSPOSE(array)

Converts a vertical range of cells to a horizontal range, or vice versa

Data1
1
2
3

Data2	1	2	3

Formula	Result			Remarks
{=TRANSPOSE(B6:B8)}	1	2	3	Data1 has been converted to a horizontal range from its vertical orientation. The formula is inserted as an Array Formula.
{=TRANSPOSE(C10:E10)}	1			Data2 has converted to a vertical range from its horizontal orientation. The formula is inserted as an Array Formula.
{=TRANSPOSE(C10:E10)}	2			
{=TRANSPOSE(C10:E10)}	3			

82. TYPE

TYPE(value)

Returns an integer represnting the data type of a value: number = 1, text = 2; logical value = 4, error value = 16; array = 64

P26

TYPE(value)

Returns an integer represnting the data type of a value: number = 1, text = 2; logical value = 4, error value = 16; array = 64

Data
Marissa

Formula	Result	Remarks
=TYPE(B7)	2	Returns the type of the value in B7. The Text type is indicated by 2.
=TYPE("Ms. "&B7)	2	Returns the type of "Ms. Marissa", which is a Text.
=TYPE(100/0)	16	100/0 returns an error value. So the formula returns 16.
=TYPE({1,2;3,4})	64	Returns the type of an array constant, which is 64.

Warnings

■ TYPE is most useful when you are using functions that can accept different types of data, such as ARGUMENT and INPUT. Use TYPE to find out what type of data is returned by a function or formula.

■ You cannot use TYPE to determine whether a cell contains a formula. TYPE only determines the type of the resulting, or displayed, value. If value is a cell reference to a cell that contains a formula, TYPE returns the type of the formula's resulting value.

83. VALUE

VALUE(text)

Converts a text string that represents a number to a number

N26

VALUE(text)

Converts a text string that represents a number to a number

Data	
$	1,000.00
	2:45:30 AM

Formula	Result	Remarks
=VALUE(B6)	1000	Converts the value in cell B6 into a number.
=VALUE(B7)	0.11493	Converts the value in cell B7 into a number.

Warnings

■ Text can be in any of the constant number, date, or time formats recognized by Microsoft Excel. If text is not in one of these formats, VALUE returns the #VALUE! error value.

■ You do not generally need to use the VALUE function in a formula because Excel automatically converts text to numbers as necessary. This function is provided for compatibility with other spreadsheet programs.

I. RANK FUNCTIONS

84. RANK

RANK(number, ref, [order])

This function is available for compatibility with Excel 2007 and other.

Returns the rank of a number in a list of numbers: its size relative to other values in the list

N23

RANK(number, ref, [order])

This function is available for compatibility with Excel 2007 and other.

Returns the rank of a number in a list of numbers: its size relative to other values in the list

Data
7
3.5
3.5
1
2

Formula	Result	Remarks
=RANK(B8, B7:B11)	2	Order is 0 or omitted, the values are arranged in descending order.
=RANK(B9, B7:B11)	2	RANK function gives duplicate numbers same rank.
=RANK(B10, B7:B11, 1)	1	Order is 1, the values are arranged in ascending order.
=RANK(B10, B7:B11, 0)	5	Order is 0 or omitted, the values are arranged in descending order.

Warnings

■ RANK gives duplicate numbers the same rank. However, the presence of duplicate numbers affects the ranks of subsequent numbers. For example, in a list of integers sorted in ascending order, if the number 10 appears twice and has a rank of 5, then 11 would have a rank of 7 (no number would have a rank of 6).

85. RANK.AVG

RANK.AVG(number, ref, [order])

Returns the rank of a number in a list of numbers: its size relative to other values in the list; if more than one value has the same rank, the average rank is returned

P25

RANK.AVG(number, ref, [order])

Returns the rank of a number in a list of numbers: its size relative to other values in the list; if more than one value has the same rank, the average rank is returned

Data
89
90
87
98
96
85
85
98

Formula	Result	Remarks
=RANK.AVG(B8, B7:B14)	4	Numbers are arranged in descending order and 90 ranks 4.
=RANK.AVG(B13, B7:B14, 1)	1.5	You get the average rank of number 85 when the numbers are in ascending order.
=RANK.AVG(B14, B7:B14, 1)	7.5	You get the average rank of number 98 when the numbers are in ascending order.

Warnings

■ If Order is 0 (zero) or omitted, Excel ranks number as if ref were a list sorted in descending order.
■ If Order is any nonzero value, Excel ranks number as if ref were a list sorted in ascending order.

86. RANK.EQ

RANK.EQ(number, ref, [order])

Returns the rank of a number in a list of numbers: its size relative to other values in the list; if more than one value has the same rank, the top rank of that set of values is returned

Q26

RANK.EQ(number, ref, [order])

Returns the rank of a number in a list of numbers: its size relative to other values in the list; if more than one value has the same rank, the top rank of that set of values is returned

Data
89
90
87
98
96
85
85
98

Formula	Result	Remarks
=RANK.EQ(B8, B7:B14)	4	Numbers are arranged in descending order and 90 ranks 4.
=RANK.EQ(B13, B7:B14, 1)	1	You get the top rank of number 85 when the numbers are in ascending order.
=RANK.EQ(B14, B7:B14, 1)	7	You get the top rank of number 98 when the numbers are in ascending order.
=RANK.EQ(B10, B7:B14, 1)	7	You get the top rank of number 98 when the numbers are in ascending order.

Warnings

- If Order is 0 (zero) or omitted, Excel ranks Number as if Ref were a list sorted in descending order.
- If Order is any nonzero value, Excel ranks Number as if Ref were a list sorted in ascending order.
- RANK.EQ gives duplicate numbers the same rank. However, the presence of duplicate numbers affects the ranks of subsequent numbers. For example, in a list of integers sorted in ascending order, if the number 10 appears twice and has a rank of 5, then 11 would have a rank of 7 (no number would have a rank of 6).

J. LOGICAL FUNCTIONS

87. AND

AND(logical1, [logical2], [logical3], [logical4], …)

Checks whether all arguments are TRUE, and returns TRUE when all arguments are TRUE

N25

AND(logical1, [logical2], [logical3], [logical4], …)

Checks whether all arguments are TRUE, and returns TRUE when all arguments are TRUE

Formula	Result	Remarks
=AND(TRUE, TRUE, TRUE)	TRUE	All arguments are TRUE, the formula returns TRUE.
=AND(TRUE, FALSE, TRUE, TRUE, TRUE, TRUE)	FALSE	One argument is FALSE, the formula returns FALSE.
=AND(1+2 = 3, 3+4 = 7)	TRUE	All arguments are TRUE, the formula returns TRUE.

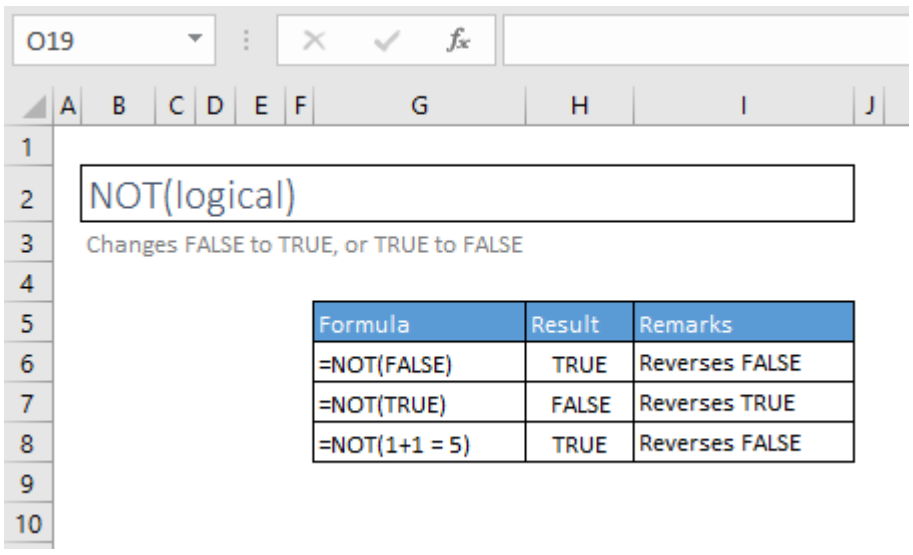
Warnings

- The arguments must evaluate to logical values, such as TRUE or FALSE, or the arguments must be arrays or references that contain logical values.
- If an array or reference argument contains text or empty cells, those values are ignored.
- If the specified range contains no logical values, the **AND** function returns the #VALUE! error value.

88. NOT

NOT(logical)

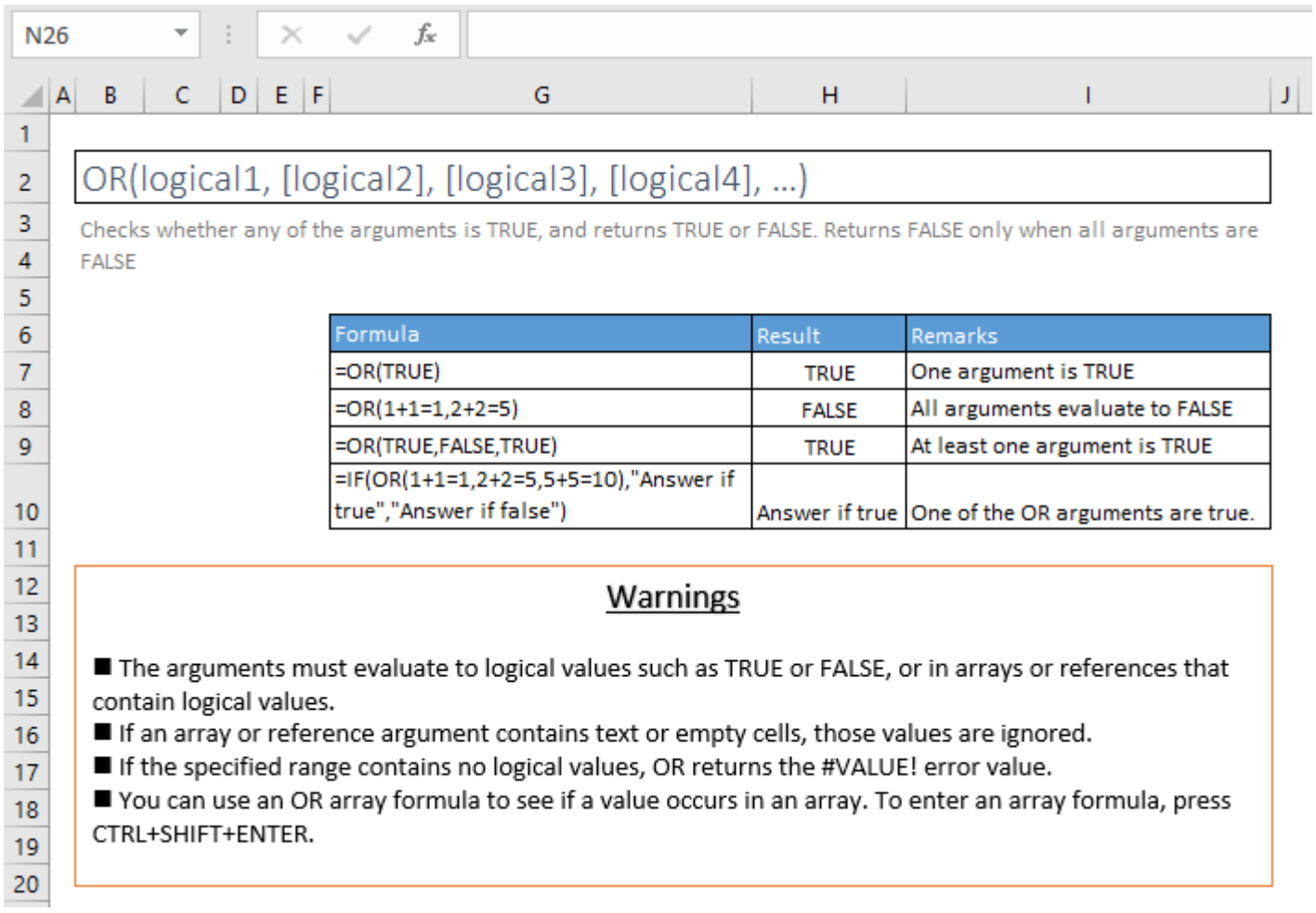
Changes FALSE to TRUE, or TRUE to FALSE



89. OR

OR(logical1, [logical2], [logical3], [logical4], …)

Checks whether any of the arguments is TRUE, and returns TRUE or FALSE. Returns FALSE only when all arguments are FALSE



90. XOR

XOR(logical1, [logical2], [logical3], …)

Returns a logical 'Exclusive Or' of all arguments

P24

XOR(logical1, [logical2], [logical3], ...)

Returns a logical 'Exclusive Or' of all arguments

Formula	Result	Remarks
=XOR(3>0,2<9)	FALSE	Because one of the two tests evaluates to True, TRUE is returned.
=XOR(3>12,4>6)	FALSE	Because all test results evaluate to False, FALSE is returned. At least one of the test results must evaluate to True to return TRUE.

Warnings

- The arguments must evaluate to logical values such as TRUE or FALSE, or in arrays or references that contain logical values.
- If an array or reference argument contains text or empty cells, those values are ignored.
- If the specified range contains no logical values, XOR returns the #VALUE! error value.
- You can use an XOR array formula to see if a value occurs in an array. To enter an array formula, press Ctrl+Shift+Enter.
- The result of XOR is TRUE when the number of TRUE inputs is odd and FALSE when the number of TRUE inputs is even.

Thanks for reading this material. Your comments and feedbacks are highly appreciated. Let us know if you have any suggestions to make this more useful.

Hossein Nasibi

Dated: 12 Sep 2024

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